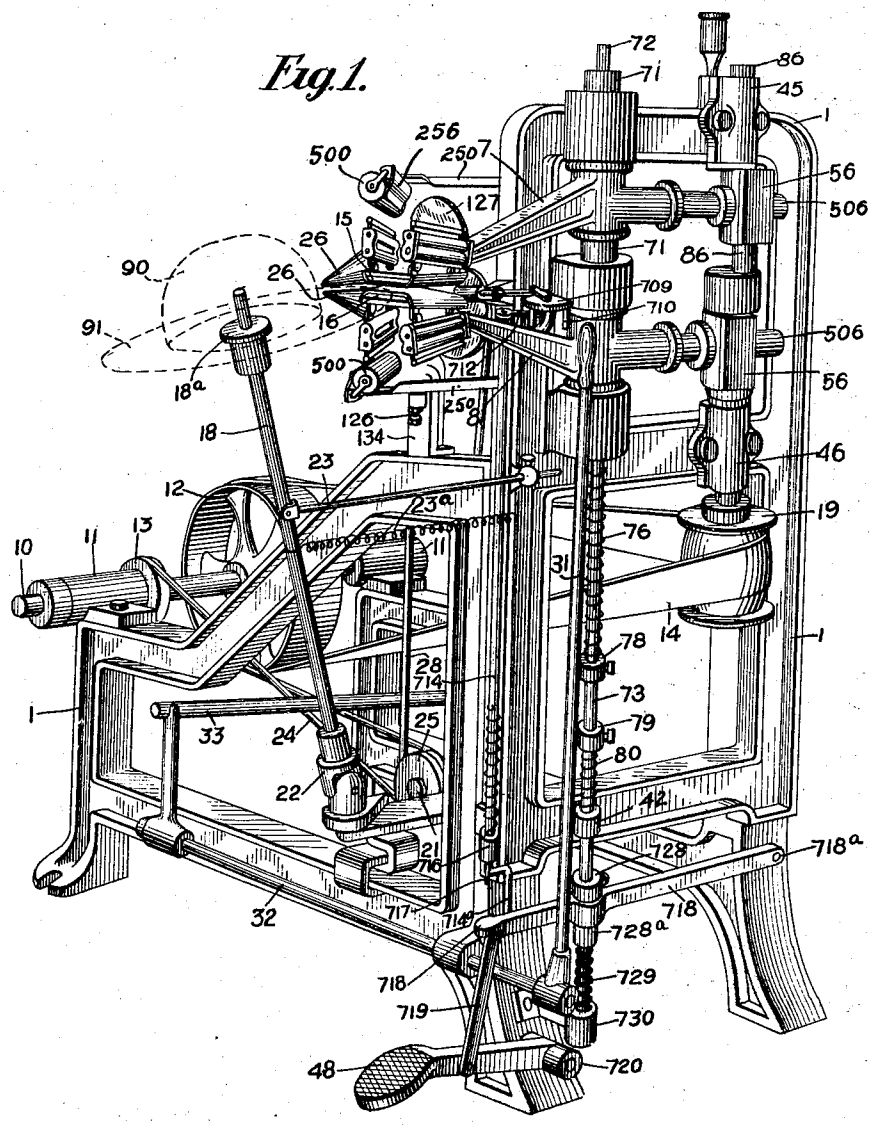
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HAT POUNCING MACHINE

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Fig. 1.



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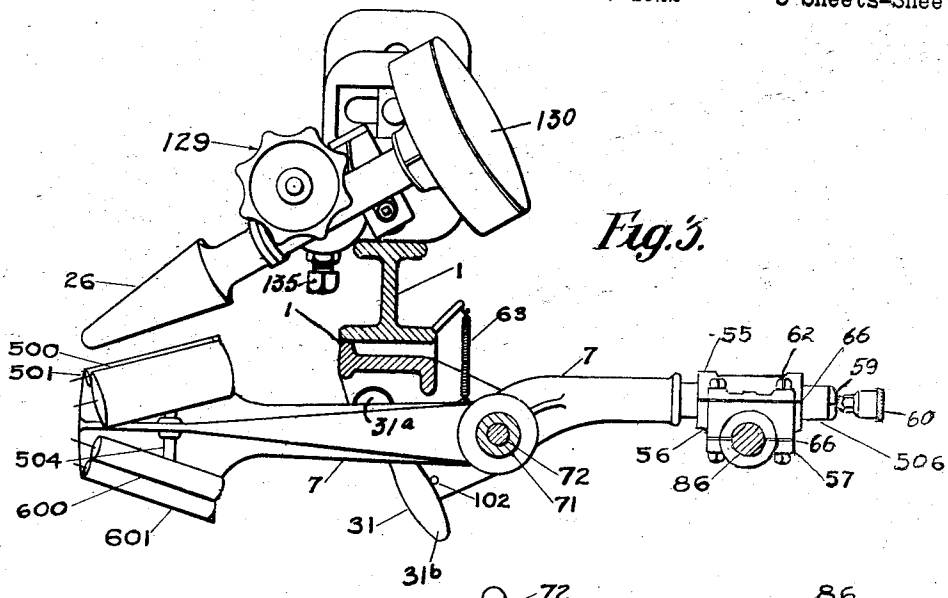


Fig. 3.

Fig. 2

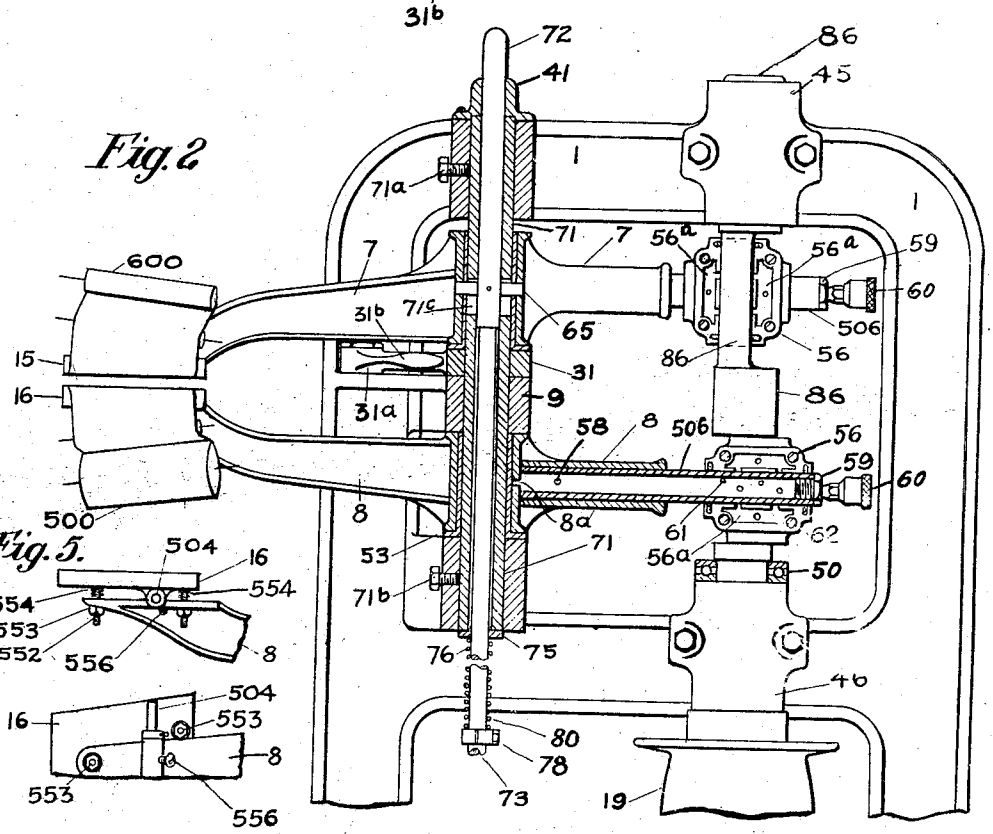


Fig. 5.

Fig. 4

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Fig.9

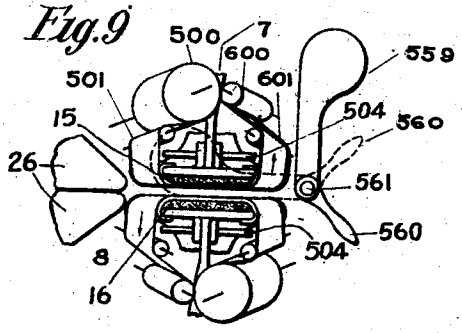


Fig.6.

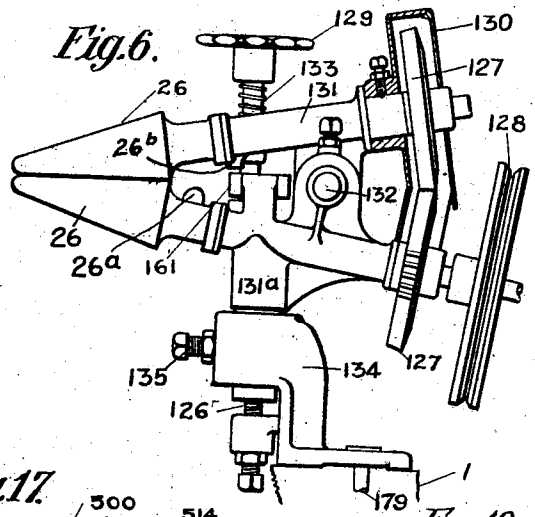


Fig.18.

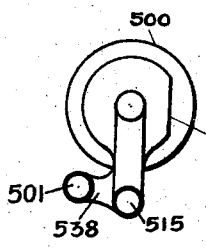


Fig.17.

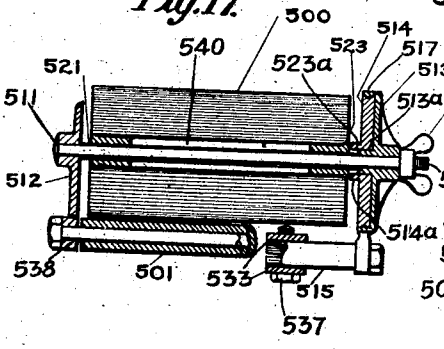


Fig.19.

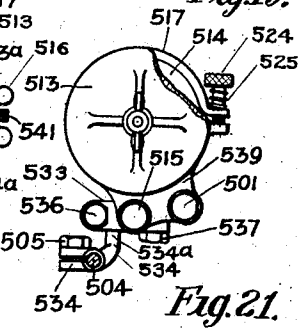


Fig.20.

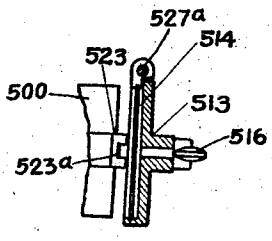


Fig.22.

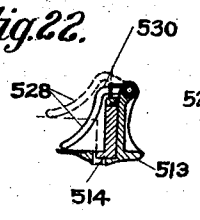
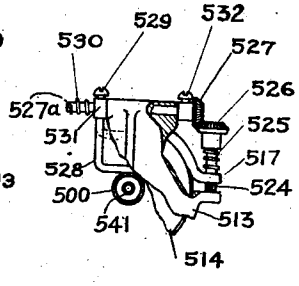


Fig.21.



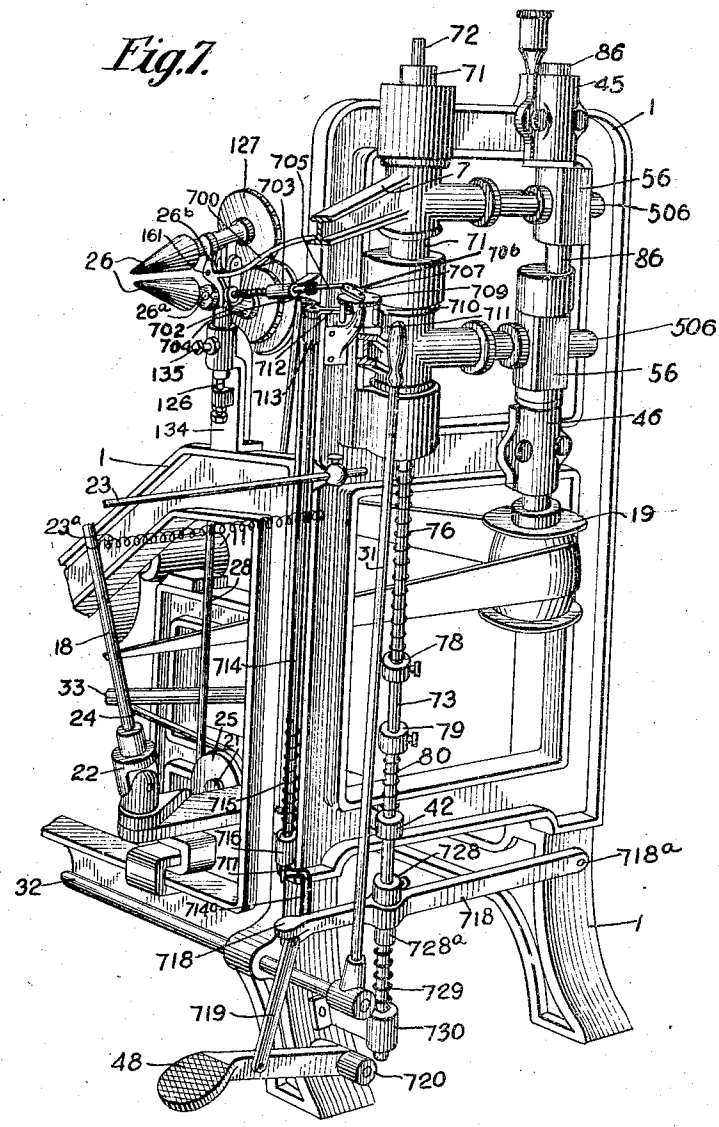
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Fig. 7.



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Fig.33

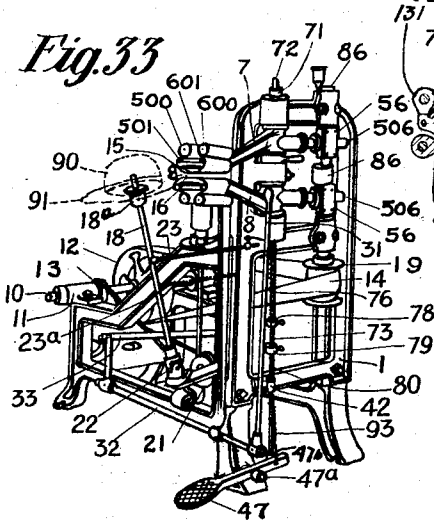


Fig.8.

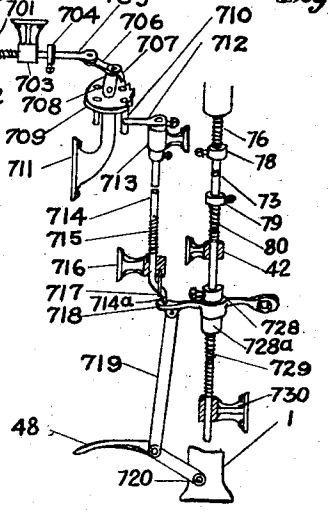


Fig.23.

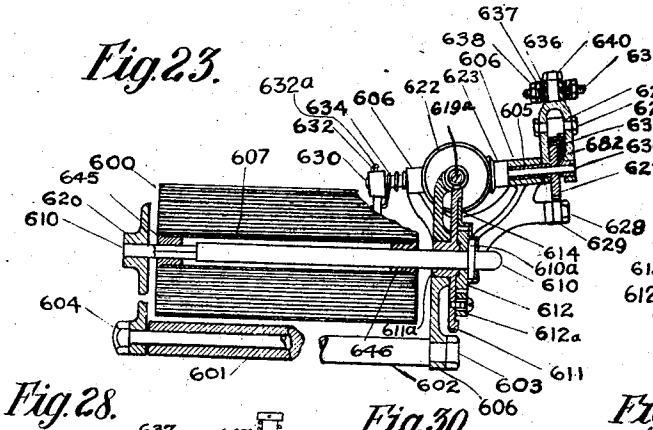


Fig.24

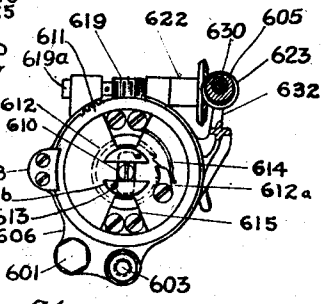


Fig.28.

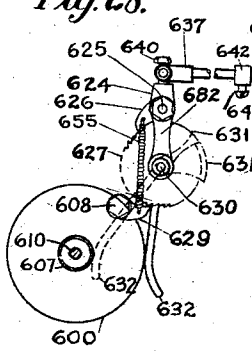


Fig.30.

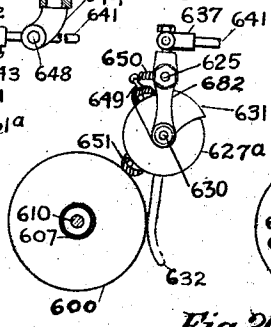


Fig.31

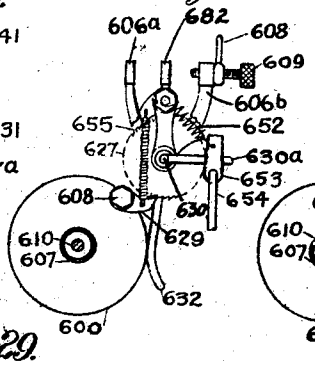


Fig.32.

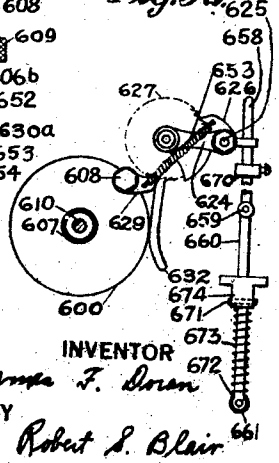
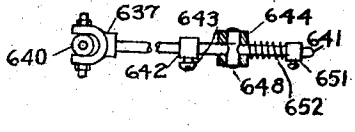


Fig.29.



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Fig.10.

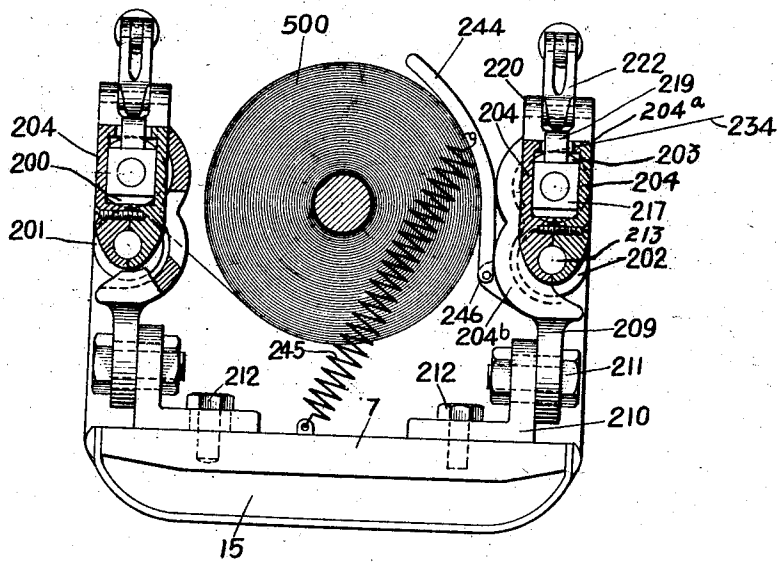
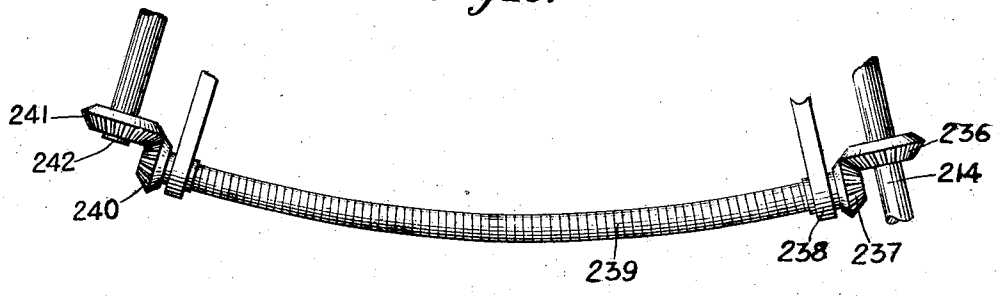


Fig.13.



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Fig.11.

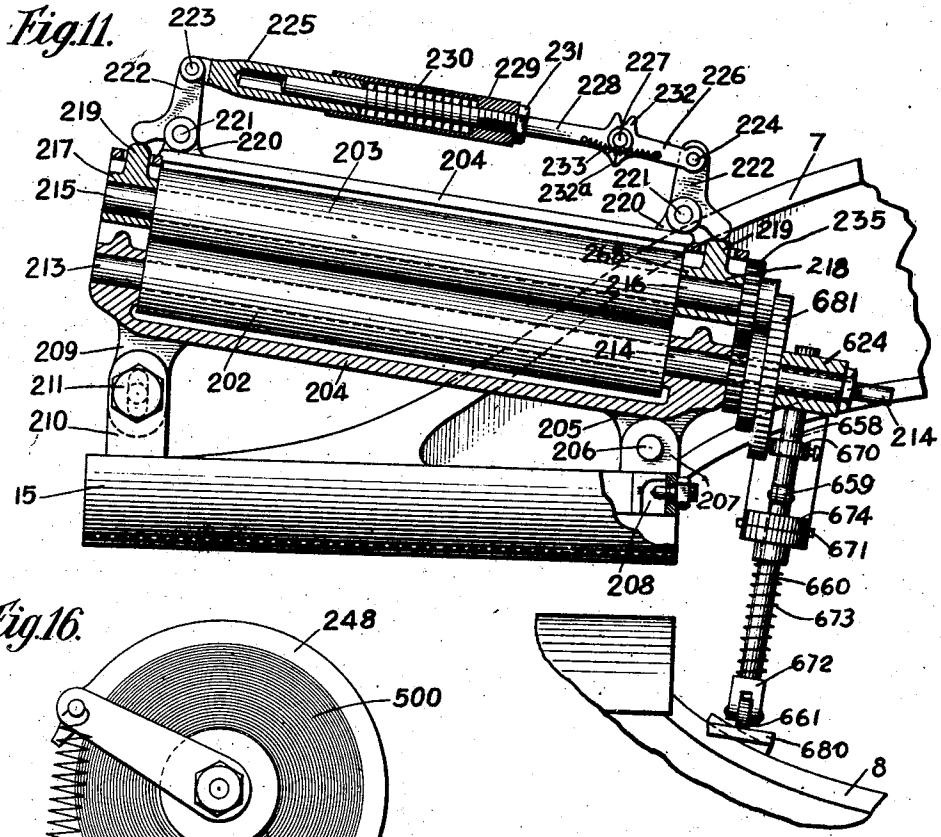


Fig.16.

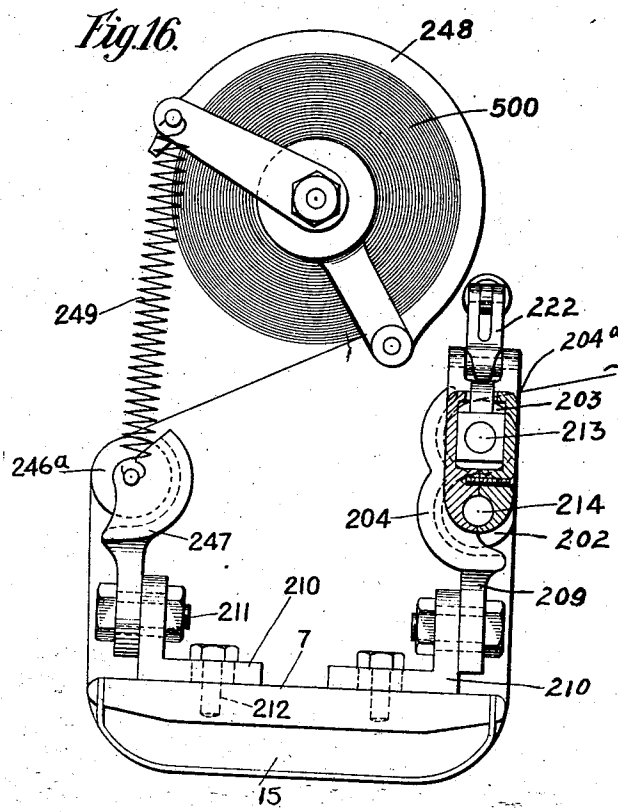
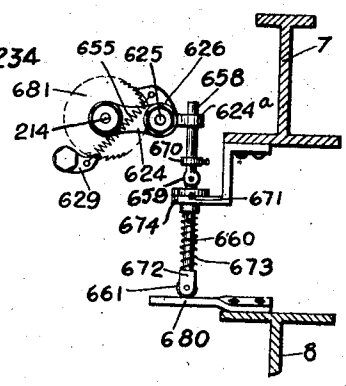


Fig.12.



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Fig.14.

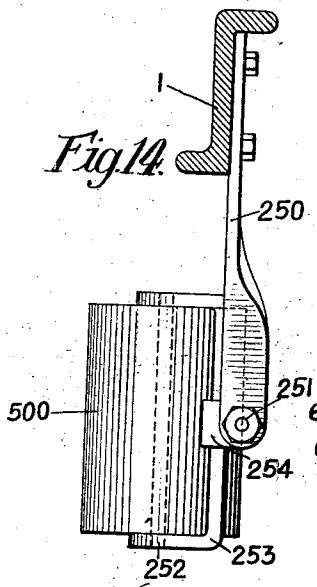


Fig.26.

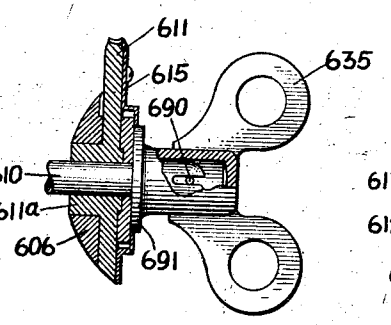
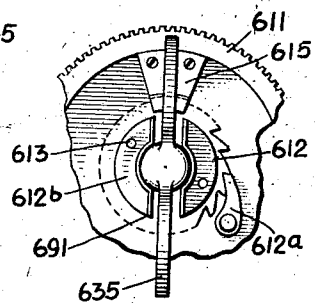


Fig.25.



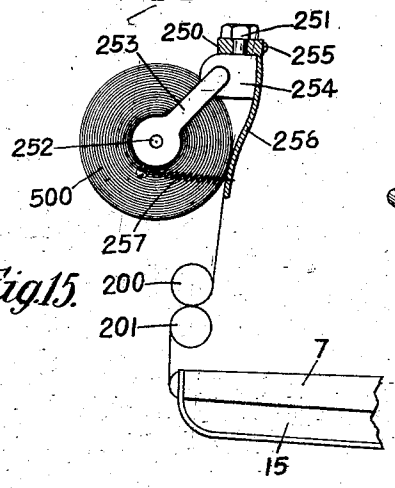
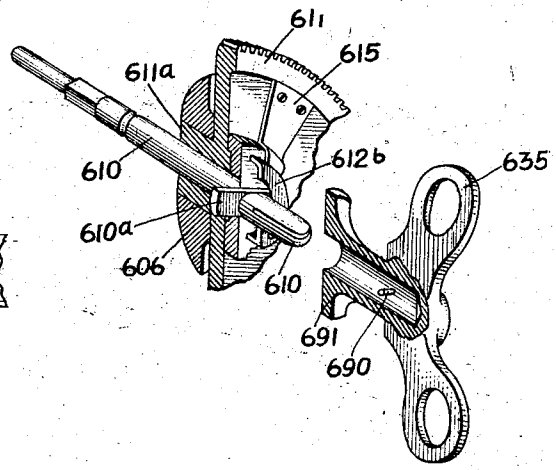


Fig.15.

Fig.27.



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UNITED STATES PATENT OFFICE

JAMES F. DORAN, OF DANBURY, CONNECTICUT

HAT-POUNCING MACHINE

Application filed June 29, 1922. Serial No. 571,609.

This invention relates to machines for pouncing or sand papering hat bodies and, more particularly, to such machines as operate on the brim portion of the hat and which are commonly known as hat brim pouncing machines.

One of the objects thereof is to provide a machine of the above nature which is capable of turning out a high grade of work in an efficient and thorough manner. Other objects are to provide a machine of the above nature which is particularly adapted to operate efficiently and reliably on hats of varying thicknesses and qualities of felt and which performs the required operations on a hat brim with great rapidity and accuracy. Another object is to provide a machine of the above nature which requires a minimum degree of attention during operation and is thoroughly dependable under the varying conditions of practical use. Other objects are to provide a machine of the above nature which is characterized by features of strength and durability, which is simple to operate and readily adjustable to meet the various requirements of practical operation. Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangements of parts as will be exemplified in the structure to be hereinafter set forth and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which are shown one or more of various possible embodiments of the several features of this invention,

Figure 1 is a perspective view of an assembled brim-pouncing machine, certain parts being shown diagrammatically in order not to encumber the drawing.

Figure 2 is a partial sectional elevation showing a means of mounting on the frame of the machine and of driving a pair of arms through whose movements the pouncing operation is performed upon the hat brim, a method of applying an abrasive covering to the operating faces of the arms being shown diagrammatically at the left.

Figure 3 is a detached plan view of one of the arms shown in Fig. 2, together with a partial plan view of a method for feeding the hat brim through between the two operating arms shown in Fig. 2.

Figure 4 is a detached upward plan view of the left-hand portion of the lower arm of Fig. 2, the abrasive covering being omitted to bring out the construction.

Figure 5 is a side elevation of the structure shown in Fig. 4.

Figure 6 is a detached side elevation, partly in section, of the brim-feeding device shown in plan in Fig. 3 bringing out its drive and mounting upon the machine frame.

Figure 7 is a partial perspective of the machine, parts being cut away to clearly show the construction of an automatic stop mechanism for arresting the action of the machine.

Figure 8 is a detached diagrammatic representation of the automatic stop mechanism shown in position on the machine in Fig. 7.

Figure 9 is a detached end view of the two moving arms looking from the front of the machine showing diagrammatically a method of applying abrasive coverings to the ends of the two arms.

Figure 10 is a detached end view, partly in section and certain parts being omitted, looking from the front of the machine showing the mounting of a mechanism for feeding an abrasive strip onto the operating surface of one of the moving arms, as shown diagrammatically in Fig. 1.

Figure 11 is a partial sectional elevation viewed from the right of Fig. 10, certain parts being cut away and parts being omitted to clearly show the construction, a mechanism for driving the feed rollers being shown at the right.

Figure 12 is a dragrammatic view showing the feed drive mechanism of Fig. 11 viewed from the right of Fig. 11.

Figure 13 is a diagrammatic plan view of a connecting gearing associated with the

rear end of the feeding mechanism shown in Figs. 10 and 11.

Figure 14 is a plan view of a means of supporting the roll of abrasive material as indicated diagrammatically in Fig. 1.

Figure 15 is an end elevation, partly in section, viewed from the lower end of Fig. 14, certain associated parts being added diagrammatically to show their relative positions.

Figure 16 is a view similar to Fig. 10 showing a possible modification of the structure shown in Fig. 10.

Figure 17 is a partial sectional elevation of one of the rolls indicated diagrammatically in Fig. 9, showing a method of mounting the same.

Figure 18 is an end view of the left side of Fig. 17.

Figure 19 is an end view of the right side of Fig. 17, certain parts being omitted and certain parts being added to more clearly bring out the construction and operation.

Figure 20 is a partial sectional plan view of the right-hand side of Fig. 17.

Figure 21 is a view similar to that shown in Fig. 19, certain parts being cut away showing other embodiments of certain parts shown in Fig. 19.

Figure 22 is a partial sectional elevation viewed from the left of Fig. 21.

Figure 23 is a partial sectional elevation of one of the rolls shown diagrammatically in Fig. 9 showing a means of mounting the same and parts of the mechanism for driving same.

Figure 24 is an end view from the right of Fig. 23, certain parts being cut away to more clearly bring out the construction.

Figure 25 is a view similar to that shown in Fig. 24, parts being cut away and certain parts being shown which are omitted in Fig. 24.

Figure 26 is a partial sectional elevation viewed from the left of Fig. 25, certain parts being cut away.

Figure 27 is a perspective of the construction shown in Fig. 26, certain parts being detached to render them more clearly distinguishable.

Figure 28 is a view from the right of Fig. 23 bringing out more clearly the driving mechanism, certain parts being shown only diagrammatically to avoid confusion.

Figure 29 is a partial plan view of the driving mechanism shown in Fig. 28.

Figures 30, 31, and 32 are views similar to that shown in Fig. 28, showing various possible modifications of the driving mechanism; and

Figure 33 is a perspective of an assembled machine showing modifications of certain parts thereof different from those shown in Fig. 1, certain parts being shown diagrammatically.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Taking up first the general description of the machine shown in perspective in Fig. 1, it is driven through the rear horizontal countershaft 10, as by belt from factory drive, the shaft 10 being mounted in bearings 11 on the rear of the frame 1. A pulley 12 fast on the shaft 10 drives a vertical double eccentric shaft 86 through a belt 14 and pulley 19. Through a pair of link box connections 56 sliding on a pair of arms 506 the rotation of the shaft 86 causes the two arms 7 and 8 to oscillate about the vertical tubular shaft 71 on which they are rotatably mounted.

Mounted upon the ends of the arms 7 and 8 are a pair of pads or cushions 15 and 16 over which an abrasive strip, as of sand paper, is gradually fed. The hat to be operated upon is indicated in dotted lines at 90 having a brim 91 which is adapted to be inserted between the oscillating pads 15 and 16. The hat 90 is supported on the upright arm 18 and its adjustable flange 18^a, or on any other suitable supporting means. The arm 18 is free to oscillate on its pivotal connection 22 and is guided in its proper movement forward and back toward the pads 15 and 16 by the side flanges of the support 22 and by the rod 23 and is normally drawn toward the pads by a spring 23^a.

It will be understood that the hat while being pounced is stretched over a hat block as is well known, or, in other words, the hat has a hat block fitted within the crown thereof. The hat block has the usual central recess in its base into which enters the upper end portion of the arm 18 above the flange 18^a, the base of the hat block about the recess being adapted to rest upon the flange 18^a, all as will be clear from the drawings. It will be seen that the mounting for the hat which is herein disclosed is particularly advantageous, allowing the hat with its hat block to rotate freely about the upper end portion of the arm 18 and permitting the hat free in and out swinging movement about the pivot 22 toward and away from the pads, this movement resulting from the well-known oval shape of the rotating hat. The rod 23 helps to guide the hat in this oscillating movement toward and away from the pads, and if desired, this rod may be locked by the set screw shown on the frame of the machine to hold the hat outwardly against the action of the spring 23^a when the machine is not in use.

From the small pulley 13 on the countershaft 10 through a belt 24, a pulley 25 on the small countershaft 21, and a vertical belt 28, a pair of feed rollers 26, shown more clearly in Fig. 7, is driven. The brim 91 of the hat 90 is inserted between the rollers 26 and the

action of the rollers draws the hat brim through between the oscillating pads 15 and 16 and the pouncing operation is performed upon the upper and under sides of the brim by the abrasive action of the sand paper strips, the pads 15 and 16 bearing together with the required amount of pressure. To interrupt the drive and arrest the operation of the entire machine, a hand lever 31 may be provided which, through suitable cross levers as 32 and 33 with suitable connections, operates a belt-shifting device to shift the belt driving the countershaft 10 to a loose pulley.

Taking up now the operation of the machine more in detail, with reference first principally to Figs. 2 and 3 showing the construction and operation of the oscillating pad arms 7 and 8 and connections, the double eccentric shaft 86 driven, as before mentioned, though the pulley 19 is rotatably mounted in the bearing boxes 45 and 46 and the downward pressure on the face of the box 46 is lessened by use of a compression ball bearing 50. Rotatably mounted on the double eccentric shaft 86 are a pair of oscillating and reciprocating link bearings, each of which consists of a body 56 and caps 55 and 57, one bearing being at right angles to the other on the eccentric shaft 86. In Fig. 2 the eccentric bearings operating the oscillating arms 7 and 8 are shown with the caps 55 and 57 removed, and the lower tubular arm 506 is shown in section to clearly bring out the construction. Referring to the lower oscillating arm 8 and its connections which are substantially the same as those of the upper arm 7, the tubular arm 506 is shown fitted into a rear tubular extension of the arm 8 and held rigidly therein by any suitable means, as by a pin 58. The other end of the tubular arm 506 is provided with a bushing 59 through which grease may be fed from a grease-cup 60 to the interior thereof to lubricate the sliding bearing surface of the arm 506 through the openings 61 therein and also to lubricate the bearing of the shaft 86 and to supply the felt filled reservoir chambers 56^a in the boxes 56 with reserve lubricant through a passage, not shown. Lubricant may also pass from the interior of the hollow arm 506 through a passage 8^a to lubricate the bearing shaft of the oscillating arm 8 which will be hereinafter described. The same fastening bolts 62 secure both caps 55 and 57 to the main body 56 of the link boxes, and laminated shims between the caps and body are provided as at 66 in Fig. 3 so that wear may be quickly and easily taken up. The link box is free to slide upon the arm 506 through the lateral bearing between the cap 55 and the body 56 and the shaft 86 is free to rotate in its vertical bearing between the cap 57 and the body 56. Thus, as the eccentric shaft 86 revolves it gives the link bearings 56 a combined oscillating and reciprocating motion. The reciprocating motion is taken up by the link bearings sliding on the tubular shaft 506 and the oscillating movement is transmitted through the arms 506 to the arms 7 and 8 which oscillate around the axis of a stationary tubular bearing shaft 71. This shaft is held in place in the frame 1 of the machine by suitable set screws 71^a and 71^b. The bearings in the arms 7 and 8 about the shaft 71 are bronze bushed and the shaft bearing 71 is of hardened and ground tool steel, and is automatically lubricated through the opening 8^a from the lubricating chamber within the tubular arm 506, as before described.

Passing through the center of the hollow bearing shaft 71 is a rod 73 connected at its lower end with a mechanism which will be hereinafter described and guided in its central movement by a bushing 75 fitted into the end of the hollow shaft 71 and by a collar 42 which is secured to the frame 1 (see Fig. 1). Passing through the arm 7 and an upper enlarged portion 72 of the rod 73 is a pin 65 which fits snugly into both the arm 7 and the rod 72 but passes freely through an elongated slot 71^c in the bearing shaft 71 so that any upward movement of the rod 73 because of the pin connection 65 will cause the arm 7 to move upwardly, sufficient bearing surface being provided for the arm 7 upon the bearing shaft 71 and for the upper box-link 56 upon the shaft 86 to permit of such axial movement of the arm 7. Thus, assuming that the arms 7 and 8 are together, as when operating upon a hat brim, an upward movement of the rod 73 will raise the arm 7 away from the arm 8 and release the hat.

Referring again to Fig. 1, on the lower extension of the rod 73 is a compression spring 76, an adjustable collar 78, a second adjustable collar 79, and a second compression spring 80. Assuming that there is little or no upward pressure applied to the arm 7 through the rod 73, the arm 7 will drop due to its weight until the pads 15 and 16 come into contact to bear against the hat brim. On some hat bodies this weight provides sufficient bearing pressure for pouncing; others require more pressure than is given by the weight of the arm 7 and others less, and the spring 76 and the adjustable collar 78 are provided so that by adjustment of the latter, the spring 76 may be compressed more or less and the necessary pressure may be added to the weight of the arm 7. Where it is necessary that less weight be provided than is given by the normal weight of the arm 7 and its parts, the adjustable collar 78 is so set that no action comes from the spring 76 and the adjustable collar 79 is set so that when the arm 7 drops, compression will be put on

the spring 80 and thus decrease the pressure on the hat brim due to the normal weight of the arm 7.

Taking up now the operation of the brim feed rollers 26, they are driven, as before mentioned, from the vertical belt 28 (Fig. 1), which belt engages the pulley 128, shown clearly in Fig. 6. Referring principally to Figs. 3 and 6, the pulley 128 is fast on the shaft which drives the lower feed roller 26 and through a pair of bevel gears 127 provided with a guard 130 the upper feed roller 26 is driven at the same speed. The bearing sleeve 131 of the shaft driving the upper feed roller 26 is pivoted as at 132 and by adjustment of the hand screw 129 the compression in the spring 133 may be adjusted to regulate the bearing pressure between the two rollers 26. The feed rollers are mounted upon a bracket 134 adjustably secured to the frame 1 by suitable bolts as 179, and the rollers may be adjusted vertically by means of a set screw 126 and circumferentially by the free bearing of the lower bearing sleeve 131[a] in the bracket 134 to insure their proper alignment with the reciprocating pads 15 and 16, and they are locked in position by a set screw 135. The position of the rollers 26 and their mounting upon the machine may be better realized by reference to Fig. 7.

From the description thus far it will be understood that the blocked hat 90 (Fig. 1) is supported upon the rod 18; the brim 91 is gripped between the feed rollers 26 and drawn through between the abrasive surfaces on the pads 15 and 16 mounted upon the ends of the two arms 7 and 8 which oscillate in opposite directions about their bearing shaft 71. An upward movement of the arm 73 will separate the pad faces to permit the removal or insertion of a hat brim. Certain advantages of this invention may be realized by the provision of manual means which will be hereinafter described for bringing about this separation of the operating pads 15 and 16. However this necessitates the attendance of an operator at all times to arrest the operation of the machine when the hat has been sufficiently pounced. Also, when the pouncing operation has been finished and the pad faces separated for easy removal of the hat brim, the brim is still pressed by the feed rollers 26 and it is necessary to twist the hat and to wait until the brim is fed out of contact with the feed rollers before it may be removed. Considerable time is thus wasted and there is a danger of wrinkling the brim by twisting the same and having a damaging crease rolled into it.

Referring to Figs. 7 and 8, there is shown a device by means of which the operation upon the hat is automatically stopped after a predetermined amount of work has been given the brim and at the same time the feed rollers 26 are automatically separated. Pivotally fastened to the frame 1 as at 718[a] is a swinging arm 718 through which freely passes the upright rod 73. Adjustably fastened to the rod 73 by the arm 718 is a collar 728, and mounted on the rod below the arm 718 is a slidable collar 728[a]. Between the collar 728[a] and the bearing 730 which is secured to the frame 1 of the machine and through which the rod 73 slides freely is a compression spring 729. The spring 729 is much stronger than either of springs 76 or 80 and is sufficiently strong so that if the arm 718 is not restrained in its upward movement the spring 729 will overcome the weight of the arm 7 and its parts and also any force that is directed against it by the spring 76. Connected to the bottom of the lever 718 is a link 719 the other end of which is fastened to a foot lever 48 swiveled to the frame 1 at as 720. The spring 729 thus tends always to raise the rod 73 together with the arm 718 and the foot lever 48 through the link 719 and, if unrestrained, holds the arm 7 in raised position away from the arm 8, as shown in Figs 1 and 7.

Freely mounted in the bearings 716 and 713 which are fastened to the frame 1 is a rod 714 which, by action of a torsion spring 715, always tends to rotate clockwise (looking down upon the same) and is restrained in this movement by a stop pin 717 secured to the bearing 716. The lower end of the rod 714 has an eccentric point 714[a] which rests on top of the arm 718, as shown in Fig. 8, and thus normally holds it down against the action of the spring 729, in this position the arms 7 and 8 and the pads 15 and 16 being together. Adjustably secured to the top of the rod 714 is an arm 712 extending at right angles thereto. Freely mounted on a stationary arm 711 secured to the frame 1 is a ratchet 709 in which there are one or more openings 708 to receive pins 710. The ratchet 709 is revolved by the action of a pawl 707 through a link 706 and the movement of an arm 705. The arm 705 is mounted freely in a stationary bearing 703 secured to the frame and has mounted upon it an adjustable collar 704 and a spring 702 tending to pull the arm 705 to the left until collar 704 strikes the bearing 703.

On the hub of the lower revolving feed roller 26 is a cam projection 26[a], also shown in Fig. 6. With each revolution of the feed roller 26 the cam surface 26[a] pushes the rod 705 to the right and through the link 706 and the pawl 707, the ratchet 709 is caused to revolve; this very slowly as the feed rollers travel at a very slow rate. Any amount of rotation given the ratchet 709 with each revolution of the rollers 26 may be regulated by adjusting the position of the collar 704. The pins 710 revolve with the

ratchet 709 and will contact with the arm 712 thus swinging the rod 714 counter-clockwise around its axis against the action of the torsion spring 715 which causes the eccentric point 714ª of the rod 714 to swing across the top of the lever 718 and finally over the edge, at which time the lever 718 is made free to move upwardly by the action of spring 729, and the main oscillating pad arm 7 is also moved upwardly away from the arm 8 through the action of the rod 73 as before described. The length of time that the machine will run before this automatic throw-off occurs is determined by the amount of movement of the ratchet 709 with each revolution of the feed roller 26 or by the setting of the pin 710. By placing several holes in the ratchet 709 to receive more than one pin 710 this action may be hastened or delayed at will and the predetermined amount of work for the hat may be arranged.

If it is desired to immediately start the machine again and pressure is put on by lever 48 to draw the arm 718 below the restraining eccentric point 714ª of the rod 714, the fact that the throw-off pin 710 is in contact with the lever 712 would prevent the rod 714 from swinging over the top of the arm 718 by the action of its spring 715. Again, the feed rollers 26 are constantly running, and with no provision made the ratchet would continue to move around and there would be no way of being sure that the ratchet timing would be proper to give the predetermined amount of work at the next setting. To overcome both difficulties and also to accomplish the opening up of feed rollers 26 at the end of the operation for easy insertion and removal of the hat brim there is provided a bell crank rocker arm 700 which is pivoted to the lower feed roller casting at 161 (see Fig. 6) with one arm extending upwardly and resting on the flange or top of the main oscillating arm 7 and another arm forking around the slide rod 705 and contacting with the fixed collar 701 thereon. A part of this arm also forms a cam surface 700ª which contacts with a bearing surface 26ᵇ on the bearing sleeve 131 of the upper feed roller 26 (see also Fig. 6).

When the upright restraining arm 714 swings and allows the arm 718 to raise upwardly and with it the main operating arm 7 as described, the contact between the lever arm 700 and the flange or top of arm 7 moves the arm 700 around its axis 161 and this in turn causes the forked arm to move to the right and push the slide rod 705 against the action of the spring 702 to the right and thus throw the rod 705 out of contact with the rotating feed roller cam 26ª. Thus, any further action of the cam 26ª and the arm 705 is prevented while the oscillating arm 7 is upward or out of contact with the ocillating arm 8 or while the pouncing pads are not acting on the hat brim. At the same time the cam 700ª acts on the bearing 26ᵇ on the top feed roller 26 and causes the upper roller to be lifted out of feeding contact with the lower roller.

When the forked arm of the lever 700 is moved to the right as described it gives an extra long movement to the arm 705 which is sufficient through the action of the pawl 707 and the ratchet 709 to move the pin 710 so far that it moves beyond contact with the arm 712 and, therefore, when the foot lever 48 is pushed downwardly and draws with it the arm 718 below the lowest point on the rod 714 the torsion spring 715 immediately throws the eccentric end 714ª over against the restraining pin 717 so that when the foot is removed from the lever 48 this point 714ª will be above and will contact with and restrain the arm 718 from moving upwardly by the action of the spring 729. Therefore, it will be seen that by the movement of the oscillating pad arm 7 upwardly the movement of the ratchet 709 ceases until the lever 48 is pushed downwardly again when another hat is placed in the machine to be operated upon.

Turning now to the mounting of the pads 15 and 16 on the ends of the oscillating arms 7 and 8, each pad is preferably faced with a pliable material which may be wool or felt, but I prefer to use an inflated pad using a pliable container, as rubber filled with air or a hollow pliable container with water as the flexible medium of the acting pad face over which the abrasive strip is fed. The circumference of the inner portion of the hat brim, that nearest the crown of the hat, is less than the circumference of the outer edge and there is therefore less surface to be pounced on the inner portion than on the outer portion of the brim. In addition, the axis 71 around which the pads 15 and 16 oscillate is further away from the crown of the hat than from the outer edge of the brim and this causes the front portion of the pad which is in contact with the inner or lesser brim surface to oscillate a greater amount than the rear end of the pad which is in contact with the outer or greater brim portion. To compensate for this and to insure an even pouncing of all parts of the brim, the working pad faces are made narrower in the front than in the rear, as clearly shown in Figs. 3 and 9, and practice has enabled the determination of the proper taper to produce the best results.

Some hat brims vary in thickness of the felt from the inner portion near the crown to the outer edge and it is for this reason in part that it is desirable to use a soft cushion or a pad. Where the unevenness is excessive, however, I prefer to have one of the

pads mounted in a pivotal manner so that it will conform exactly to the uneven conditions of the brim. This is best shown in Figs. 4 and 5 in which the lower pad 16 is shown pivoted upon a transverse axis 504 upon the end of the arm 8. The adjusting bolts 552 and nuts 553 may be used either to get the proper angle and then securely fasten the pad in place, or they may be used preferably to simply limit the movement of the pad; and by the springs 554 the pad is normally kept in the central position but will conform exactly to the thickness or angle of the brim as soon as the pads are brought into contact with it.

Since the hat being worked upon is kept in position in relation to the front of the pads by being drawn toward the same, there is a likelihood that the hat will be pushed in so far that the front portion of the upper pad will rub against the crown portion of the hat and leave a mark on the crown that injures the body. To overcome this difficulty I make use of a protective shield 559, shown in Fig. 9. This shield 559 is pivoted to the stationary frame 1 in any suitable manner, as at 561, and when in use is swung into position indicated by the dotted lines by means of the handle 560 so that it comes between the crown of the hat and the front of the working pad 15. The shield 559 is stationary so that any rubbing motion that comes from the front of the moving pad is against the back portion of the shield, which may either rest on the brim of the hat in the position indicated in dotted lines, or which may have a restraining lug for a stop just before it contacts with the brim of the hat.

Various means may be employed for applying the abrasive covering of sand paper to the two resilient pads 15 and 16 and which performs the pouncing operation upon the upper and under brim of the hat as the same is fed therebetween by the rollers 26, but I prefer to provide a strip or a roll of sand paper for each pad which is fed across the surface of the pad by means to be hereinafter described thus insuring the utilization of all the paper and a uniform abrasive surface in position at all times to operate evenly upon all portions of every hat brim. The roll of sand paper may be replenished as is necessary only at long intervals and the abrasive property of all the paper is used to the best advantage.

Referring again to Fig. 1, there is shown suspended above the operating pad 15 upon the end of the oscillating arm 7 a roll 500 of abrasive material such as sand paper held in position by an arm 250. Below the operating pad 16 is suspended a similar roll 500 by a similar arm 250. The mounting of both sand paper rolls and the mechanism for feeding the strips across the pad faces 15 and 16 are substantially identical and are shown only diagrammatically in Fig. 1. In Fig. 10 there is shown in enlarged detail a front end view of the sand paper feeding mechanism shown diagrammatically in Fig. 1. With regard to Fig. 10 and also to Fig. 16, which will be described later, it may be here mentioned that since the pad 15 is wider at the rear than at the forward end and since the feeding mechanism now to be described is aligned with the sides of the pad 15, a true end view similar to those shown in Figs. 10 and 16 would show the rear portions of the pad and the sand paper feeding mechanism. These parts, however, have been omitted in Figs. 10 and 16 in order not to encumber the figures. The position of the roll 500 in Fig. 10 is different from that shown in Fig. 1 and its mounting in such position will be described hereinafter.

Referring now to Fig. 10 and to Fig. 11, which is a side view of the feeding mechanism shown in Fig. 10, there are shown the upper oscillating pad arm 7 and the flexible pad 15 mounted at its end. From the sand paper supply roll 500 before mentioned the sand paper strip is fed between a pair of rollers 200 and 201 (Fig. 10) over the face of the pad 15 and between a pair of rollers 202 and 203 after which it is torn off. These rollers 200, 201, 202 and 203 may be made of any material, but I prefer to have them coated with rubber or other pliable substance both for the frictional properties and in order that the sanded face of the paper may be imbedded into the roller faces to accomplish more accurate feeding or delivering. The mounting of rollers 200 and 201 is substantially the same as that of the rollers 202 and 203, therefore one mounting only will be described.

Referring to Fig. 11, a casting 204 has at one end a downwardly extending lug 205 which is supported and pivoted on a pin 206, which pin in turn is mounted in the flange 207 whose circular downwardly extending base 208 is adjustably journaled in an opening in the pad arm 7. On the left-hand side of the casting 204 there is another downward projection 209 which is adjustably secured to an upright arm of an angular support 210 as by means of a bolt 211. The other arm of the angular support 210 (see Fig. 10) is adjustably secured to the pad arm 7 as by a bolt 212. These adjustments and fastening means provide for securely supporting the casting 204 and its parts in any position in which it may be set in relation to the angular side of the pad 15. The purpose of these adjustments is to position the two rollers 202 and 203 having their mountings in the casting 204 so that they either receive properly the sand paper strip as it leaves the pad or deliver it properly to the correct position on the pad. A ver-

tical adjustment of the front end of the rollers is necessary since the pad 15 is narrower at the front than at the rear and the lengths of the paths of travel of the two edges of the sand paper strip between the rolls 200 and 201 and the rolls 202 and 203 must be equal in order to enable the strip to pass properly through between the rollers. The raising of the front end of the rollers compensates for the difference in the width of the pad, front and rear.

The stud supports 213 and 214 for the shaft carrying the roller 202 have their bearings in the upright ends of the casting 204. The stud supports 215 and 216 for the roller 203 have their bearings in the boxes 217 and 218 which are slidably mounted in the upright ends of the casting 204. The boxes 217 and 218 are held in place against any sideway movement by the side walls of the casting 204 and against in and out movement by the engagement of their upper circular extensions 219 in finished openings in the top of the upright ends of the casting 204. Mounted on the top of the casting 204 are two projections 220 which form bearings for the pins 221 and they in turn support freely a pair of rock levers 222, the lower arms of which contact with the extension tops 219 of the boxes 217 and 218. The upper arms form bearings for a pair of pins 223 and 224. To the pin 223 is freely mounted one end of tubular shaft 225 and to the pin 224 is freely mounted a rod 226. The rod 226 is joined by a pivot pin 227 to a rod 228 which is partly screw-threaded and has an unthreaded portion which passes within and is freely supported and held in alignment in the tubular shaft 225. The screw-threaded portion of the rod 228 is engaged by a tubular nut 229, the hollow portion of which passes freely over and holds in alignment the shaft 225. Coiled upon the rod 228 within the tubular nut 229 with one end abutting the end of the tube 225 and the other the shoulder of the tubular nut 229 is a compression spring 230. By adjustment of the nut 229 of screw-threaded rod 228 the spring 230 may be compressed more or less, and more or less pressure is exerted outwardly on the bell crank arms 222 and in turn on the top roller stud support boxes 217 and 218 to the feed rollers.

By this arrangement uniform pressure is placed on both bearings of the upper roller and along the line of contact of the two rollers and insures uniform feeding, and if the paper should vary in thickness between the front and rear of its line of contact with the rollers the thicker side of the paper forces the adjustable roller 203 upward and increased pressure is transmitted to that part of the roller in contact with the thinner part of the paper. When the pressure adjustment is properly made by means of the nut 229 the setting is locked as by a check nut 231. When it is necessary to insert a new roll of paper, it would be difficult to thread it through the delivering and winding sets of rollers if they remained under spring pressure, and it would be almost impossible to be sure that the paper was set in at the proper angle to feed through the rollers straight. Therefore, it is advantageous to have the rollers either under no spring tension or under very little spring tension at the threading operation so that paper may be with ease moved forward or sideways until it is aligned and conforms with certain gauged points before the working process is thrown into action. The same advantages are gained when it is necessary to line up the paper should it start to feed out of alignment.

To provide for this and at the same time not interfere with the proper spring setting as described above the arms 226 and 228 are pivoted on the pin 227. The contact of the faces of the extension flanges 232[a] on the rods 226 and 228 prevents the upward movement of these arms around the pivot pin 227 and the extension of the line of force between the pivots 223 and 224 passing above the pivot point 227 keeps the two arms in set position. This may be aided some by the use of a small spring as 233. With little downward pressure, however, the lost force may be overcome and the rods 226 and 228 may be bent downward on the pivot 227 to a limiting position, as when the faces 232 of the flanges contact. This shortens the distance between the pivots 223 and 224 and will eliminate the action of the spring 233 on the crank arms 222 and remove pressure from the rollers so that the paper may with ease be properly inserted or set in position. The rollers 202 and 203 are preferably geared together as by gears 235, as are the rollars 201 and 202 by a similar pair of gears, not shown.

At the right-hand side of Fig. 11 and in Fig. 12 is shown a mechanism for revolving the rollers 202 and 203 and drawing a predetermined amount of sand paper across the face of the pad 15 each time the arm 7 moves away from or toward the arm 8 at the beginning or end of the operation upon the hat, as above described. Secured to the stud shaft 214 on which the roller 202 is mounted is a ratchet wheel 681. Freely mounted upon the extension of the stud shaft 214 is an oscillating arm 624 (Fig. 12) carrying a pawl 626 pivoted upon a bolt, as 625, passing therethrough, the pawl 626 being positioned to engage the ratchet 681. Passing through an elongated opening in an extension 624[a] of the oscillating arm 624 is a plunger rod 658. The rod 658 is pivoted at 659 to a rod 660 at the lower extension of which is a roller 661 which rests upon a

bracket 680 secured to the lower pad arm 8. As the pads oscillate in opposite directions the roller 661 moves back and forth along the bracket 680. The rod 660 is slidably mounted in a bearing 674 which is a part of or is rigidly secured in any manner to the upper oscillating arm 7. The rod 660 is prevented from revolving by the engagement of a pin 671 with an elongated slot in the rod 660. Between the bottom of the bearing 674 and the forked roller support 672 is a spring 673 which tends always to move the rod 660, and hence rod 658, downwardly. Adjustably fastened to the plunger rod 658 is a collar 670 which may be placed either below or above the projection 624^a of the arm 624. When it is placed below the projection 624^a and the arm 7 moves toward the arm 8 at the beginning of the operation upon the hat, the collar 670 contacts with the projection 624^a, and the arm 624 and the pawl 626 are thrust upwardly relative to the ratchet 681 causing the ratchet 681 to revolve and hence the rollers 202 and 203. When the collar 670 is placed above the projection 624^a and the pawl and ratchet are reversed, the feeding will be done when the arm 7 moves away from the arm 8. A check pawl 629 is mounted in any suitable manner upon the pad arm 7 and the two pawls may be connected by a spring 655 which serves to hold both pawls always in engagement with the ratchet 681 and also to swing the pawl 626 and the arm 624 back to normal position after the arm 7 has moved toward the arm 8 again. The amount of rotation of the rollers 202 and 203, and hence the amount of feed of the sand paper, may be regulated by adjustment of the position of the collar 670.

After the paper is threaded through the delivering rollers 200 and 201 (Fig. 10) around the pad face 15 into the winding rollers 202 and 203, the winding rollers are revolved by means of a mechanism such as just described, and through their frictional contact the paper is drawn over the face of the pad against the slipping friction of the bearings in which the rollers 200 and 201 rotate, and because of the soft yielding pad face which yields under the tension of the taut paper the feeding will be more or less jerky. This offers but few practical disadvantages, but I prefer to have the delivering rollers under power feed in unison with the driving of the winding rollers. Referring to Fig. 13, there is shown a mechanism by means of which the delivering rollers 200 and 201 and the winding rollers 202 and 203 are driven in unison. To the driving stud shaft 214 carrying the roller 202 is secured a bevel gear 236 which engages with a gear 237 supported in any suitable mounting, as 238, secured to the pad arm casting 7. To this gear is fastened a flexible shaft 239 or other suitable adjustable connection to allow for the setting of the castings 204 in proper alignment and angle as already described. To the other end of the flexible shaft 239, preferably with a slidable key connection, is secured a gear 240 supported in any suitable manner which is in mesh with a gear 241 secured to the shaft 242 upon which the delivering roller 201 (Fig. 10) is mounted. The rollers 200 and 201 are preferably geared together as are rollers 202 and 203 by gears such as 235 (Fig. 11) as before mentioned. The gearing is such that the shaft 242 on the delivering side revolves at the same speed as the shaft 214 of the winding side, or in such proportion to the speed of the winding shaft as are the diameters of the delivering and winding rollers, so that the same peripheral feed takes place on each side.

I prefer that in the construction just described, while in theory the exact same peripheral speed is required on the delivering as on the winding side, to have the diameters of the delivering rollers slightly smaller than the diameter of those on the winding side to insure that the feeding of the paper is always a slight amount more than the delivering amount, which insures that the paper will be kept taut and the small amount of slipping that would be necessary will occur more easily when the delivering rollers are at all times in motion.

Taking up now the support for the sand paper rolls 500 (see Fig. 1) from which the sand paper strip is fed, as above described, across the pad faces 15 and 16, referring to Figs. 14 and 15, the sand paper roll 500 is freely supported on a rod 252 which has its bearings in a bracket 253 which is slidably and freely supported in a bearing lug 254. The lug 254 is pivoted at 251 to an arm 250 which is secured to the stationary machine frame 1 in any suitable manner, as shown in Fig. 14. Since the sand paper supply roll 500 changes in diameter as it is being used, provision is made in the mounting so that the delivering or take-off side of the sand paper roll automatically shifts to maintain its position substantially tangential to the rollers 200 and 201 on the receiving side of the pad. Fastened by screw 255 (Fig. 15) to the rigid arm 250 is a stationary arm 256 which is so placed as to be on a line tangent preferably to both rollers 200 and 201. Between the end of the arm 256 and any point on the free oscillating arm support 253 is a tension spring 257. The spring 257 draws the roller 500 as its diameter decreases against the alignment arm 256, thus maintaining the delivering side of the roll 500 always in proper delivering position and causes sufficient friction on the paper roll to prevent it from unrolling too rapidly. The pivotal support through the lug 254 permits the roller 500 to be posi-

tioned so that the plane of the paper corresponds with the plane of the rollers 200 and 201. Thus the paper roll 500 is stationarily supported above the pad 15 and does not partake of the oscillating movement of the arm 7, pad 15, and the rollers 200 and 201 mounted thereon. It requires but a slight looseness in that part of the paper between the delivering rollers 200 and 201 and the sand paper supply roll 500 to allow for the pad oscillations as the looseness will only be the amount of difference between the altitude of a very acute triangle and the length of its sides, and since the base of this triangle is only about one inch, which is the amount of oscillation, and the altitude can be made any desired practical distance, the looseness of the paper is practically negligible. In this way there is no tendency to tear the paper or allow it to become bent or creased which would disturb some of the sand paper particles.

As described above, a sand paper strip is drawn from a stationary supply roll 500, between a pair of feed rollers 200 and 201, across the face of pad 15 or 16, between a pair of rollers 202 and 203, and the end passes out at the top of the casting 204 (Fig. 10) as at 234, and is torn off along a sharp edge 204a. In Fig. 16 there is shown a construction in which the two feed rollers 200 and 201 of Fig. 10 are omitted and their places taken by an idler guide roll 246a mounted upon a casting 247 secured to the pad arm 7 in the same manner as above described with regard to the casting 204 of Figs. 10 and 11. The receiving rollers 202 and 203 act in the same manner as described with regard to Fig. 11. The sand paper roll 500 may be supported in any suitable manner, as in stationary position secured to the frame of the machine as has been described with regard to Figs. 14 and 15, and as shown in Fig. 1, or it may be mounted upon pad arm 7 in a manner such as will be hereinafter described.

Turning again to Fig. 9, there is diagrammatically shown a means of applying the sand paper to pads 15 and 16 which consists in feeding the same from a supply roll 500 over an idler 501, across the pad face, over an idler 601, and onto a receiving roll 600, or vice versa, the supply roll 500 and the receiving roll 600 being both mounted on the pad arm and partaking of its movements. The feeding arrangement for both pads and the mounting of the rolls are substantially the same so that one only will be described throughout. The receiving roll 600 is driven by means to be described later and pulls the paper across the pad from the delivering roll 500.

Referring to Fig. 17, there is shown a partial sectional view of the delivering roll 500 and its mounting on the pad arm 7. In Fig. 19, which is an end view of the right side of Fig. 17, there is shown an end of the supporting stud 504 which is shown more clearly in Figs. 3, 4 and 5 in its position on the pad arms 7 or 8. Referring again to Fig. 19, adjustably fastened near the end of the stud 504 is a clamp 534 which is adjustable lengthwise of or around the stud 504 and is locked in place by a clamp screw 505. This clamp 534 has a circular stud 534a which is engaged by an opening in a secondary clamp 533 which is adjustable around the axis 534a and is clamped in place by a screw 536. The clamp 533 has a second opening passing through it at right angles to the one receiving the stud 534a in which is adjustably secured a circular cross stud 515 (see Fig. 17), which acts as a separator and brace for the two side castings 512 and 513 of the roll and is locked by a clamp screw 537. This combination of adjustments on or around the stud 504, on or around the axis of the circular extension 534a, and on or around the cross-brace 515 gives an adjustment in every possible direction for the roll support mechanism or a complete universal joint, so that it may be properly positioned to deliver the paper strip correctly to the pad 15 or to properly receive it from the pad and wind it evenly no matter what the angle of the sides of the pad may be. This universal mounting is employed both in the delivering roll 500 and the receiving roll 600.

The guide roller 501 passes through openings in lugs 538 and 539 of the side castings 512 and 513 respectively (Figs. 18 and 19). In this construction the guide roller 501 is placed parallel to the axis of the paper roll 500 and in the same plane so that when the guide roller 501 is set at the proper angle and at the proper distance from the face of the pad 15 the roll 500 will deliver or receive the paper properly. It is understood, however, that either the delivering or the winding roll may be placed in any desired position on the pad arm casting, and the roller 501 or the roller 601 may be made independently adjustable backward or forward or at any angle to the roll 500 or 600 so that they will simply act as idlers or guide rollers for the paper.

The spool 540 upon which the sand paper strip is mounted is hollow, as shown in Fig. 17, and has fitted into its ends a pair of bushings 521 and 523 through which pass a rod 541 upon which the spool is mounted and revolves. A thumb screw 516 provides for the ready removal of the rod 541 to permit removal of the spool 540. Fitted against the inner surface of the end bracket 513 is a disk 514 rotatably mounted upon a hub 513a of the bracket 513. The disk 514 has a pair of projections 514a which engage a diamet-

rical slot 523ª of the bushing 523 (see Fig. 20) so that any movement of the spool 540 about its axis 541 causes movement of the disk 514. It will be understood that since the roll 500 is delivering the sand paper there will be a tendency for it to revolve too rapidly and thus cause a looseness of the paper. Therefore, means must be employed to restrain the rotation of the roll. Surrounding the friction disk 514 and secured to or part of the casting 513 is a friction band 517 which tends to spring outwardly and may be tightened more or less in its contact with the outer surface of the disk 514 by means of a clamp screw 524 and spring 525 (Fig. 19) to serve as a restraining brake.

The larger the delivering roll 500, the more friction is required to hold the paper from loosening or the roll unwinding; and the smaller the delivering roll becomes, the lesser the arm of force that is worked against it, and the friction between the band 517 and the friction disk 514 should be decreased. In order to maintain the proper friction, in Figs. 21 and 22 there is shown a mechanism for automatically adjusting the screw 524 of Fig. 19 consisting of a small bevel gear 526 engaging with a secondary bevel gear 527 which is adjustably fastened to a shaft 527ª by a screw 532. To the other end of this shaft 527ª is adjustably fastened a collar 531 and an arm 528, part of the arm 528 resting on the surface of the paper roll 500. This arm is normally kept in contact with the surface of the paper roll by a spring 530. When the delivering roll 500 is first inserted in the machine, the arm 528 will be swung upward, as shown in dotted lines in Fig. 22. As the roll is unwound, the arm 528 through the action of the spring 530 will follow the decreasing diameter of the roll and through the shaft 527ª and gears 527 and 526 will turn the clamp screw and lessen the pressure of the band 517 against the friction disk 514. The adjustable mounting of the gear 527, as by the screw 532, allows the turning of the gear without affecting the position of the shaft 527ª in order that the proper tension may be placed on the friction band when the roll is full sized, and the arm 528 is so curved that its contacting points with the roll will bring about the proper decrease in friction between the band 517 and the friction disk 514 to suit change in diameters.

In this particular construction, as has been mentioned, the paper is drawn from the delivering roll 500, over the guide roller 501, over the face of pad 15 or 16, over the guide roller 601, and is wound on a driven receiving roll 600 (Fig. 9). Referring now to Figs. 23 and 24, the receiving roll 600 is mounted universally substantially as described with regard to the delivering roll 500 to permit its proper alignment with the side of the pad, and its two side brackets 606 and 620 are braced by a rod 602, the guide roller 601 being mounted on a shaft 604 between the two side brackets. The end of the sand paper strip is locked in a slot of the winding spool 607 similar to the manner in which a camera film is engaged by the winding spool of a camera. The winding spool 607 is made tubular with two bushings 645 and 646 fitted into its ends, the bushing 661 having a free fit on a removable shaft 610 and the bushing 660 having a square opening through which the square portion of the shaft 610 passes. Thus, when the shaft 610 is revolved, the winding spool 607 will also revolve and the sand paper will be wound thereon.

Freely journaled in the casting 606 is the hub 611ª of a worm wheel 611 and the wheel 611 is removably held in place as by a clamp 618 secured to the casting 606 (Fig. 24). Fastened to the side of the worm wheel 611 is a spring-actuated pawl 612ª, the spring being shown at 614, and freely mounted on a projecting hub on the side of the worm wheel 611 is a ratchet 612 which is kept in place by a pair of overhanging projections 615 which are secured to the face of the worm wheel 611 by screws as shown. The ratchet 612 is thus free to revolve relative to the worm wheel 611. The right-hand end of the shaft 610 has a flange 610ª, shown more in detail in Fig. 27. As a part of the ratchet 612 and hollowed out are shown two projections 612ᵇ, clearly shown in Fig. 25, between which there is a slot slightly wider than the elongated flange 610ª on the drive shaft 610, and the undercut is such that the flange projection 610ª on the shaft 610 will pass under the projections 612ᵇ. These projections, therefore, prevent the shaft from sliding to the right and out of place. In these projections 612ᵇ are two pins or stops 613 so placed that the sides of the flange 610ª will contact with them, and the shaft 610 will be prevented from taking a full revolution relative to the projections 612ᵇ. Any movement, therefore, of the ratchet 612 to the left because of contact with the pins 613 against the shaft flange 610ª will cause the shaft 610 to revolve and with it the winding spool 607.

In order to start the winding of the paper on the spool 607 or to take up any looseness of the paper it is desired to provide a manual means for winding. Referring to Figs. 25, 26 and 27, a key 635 is provided which fits over the end of the shaft 610 and is provided with a pin 690 which is adapted to engage a diametrical slot in the end of the shaft 610. The key 635 is also provided with a flange 691 which is adapted to fit into the slot between the two projections 612ᵇ. The flange 691 and the pin 690 are so posi-

tioned on the key 635 that when the flange 610[a] of shaft 610 is in engagement with pins 613 of projections 612[b], as shown in Fig. 27, the shaft 610 and the ratchet 612 through the projections 612[b] may be simultaneously turned to the left by means of the key 635, and the paper is wound on the spool 607 (Fig. 23) in engagement with the shaft 610. In order to remove the shaft 610 to replace the spool 607, it is necessary only to engage the pin 690 of the key 635 with the slot in the shaft 610 leaving the flange 691 out of engagment and to turn the shaft 610 to the left until the flange 610[a] registers with the slot between the projections 612[b] after which the shaft 610 may be withdrawn to the right.

Taking up now the means of driving the receiving roll 600 to wind the paper thereon, referring first to Fig. 24 there is shown a worm 619 fast on a shaft 619[a] which is journaled in an upper extension of the end bracket 606, the worm 619 meshing with the worm wheel 611. On one end of the shaft 619[a] is fastened a bevel gear 622 engaged by a gear 623 which is securely fastened to a sleeve 605 (Fig. 23), the sleeve 605 extending substantially at right angles to the shaft 619[a] and having a free bearing in another extension of the bracket 606. At one end of the sleeve 605 is securely fastened a ratchet wheel 627, and freely mounted to oscillate on the sleeve 605 by means to be described later and forking over the ratchet 627 is an arm 682, more clearly shown in Fig. 28, which carries the spring-actuated pawl 626 freely supported on a stud 625. A similar pawl 629 is freely mounted on a stud 608 of the bracket 606 and the two pawls are held in engagement with the ratchet wheel 627 by a spring 655. From the above it will be seen that any motion of the arm 682 to the left through the action of the pawl 626 will cause a rotation of the ratchet 627 which is restrained from backward movement by the spring-actuated pawl 629 and then through the sleeve 605 and the bevel gears 623 and 622, worm 619 and worm wheel 611, and through the action of pawl 612[a] (Fig. 24) will cause a rotation of the sand paper roll 600.

When the end of the paper is first fastened on the winding spool 607, the winding diameter is small, for example, about one-half inch, and one revolution of the winding spool will draw or feed about one and one-half inches of paper. When the roll increases in size to say two inches in diameter, one revolution of the winding shaft 610 will feed about six inches of paper. Therefore, provision must be made to adjust the number of teeth that the pawl 626 will engage to give the proper amount of feed required irrespective of the diameter of the winding roll. In order that the feeding of the paper may be made constant without the necessity of making adjustments as the diameter of the winding roll 600 changes, an automatic means is provided by which this is accomplished. Referring first to Fig. 23, passing freely through the sleeve 605 is a shaft 630 to which is securely fastened a segment 631 flanged over the ratchet 627. On the other end of the shaft 630 is adjustably fastened by a screw 632[a] an arm 632 which is held always in engagement with the surface of the roll 600 by a spring 634. Thus any movement of the arm 632 due to a change of diameter of the roll 600 will rotate the shaft 630 and cause a similar movement in the overhanging projection 631. Assuming the normal position of the oscillating pawl arm 682 to be as shown in Fig. 28 and the winding roll to be small, the arm 632 will take the position shown in dotted lines and the overhanging segment will be in the dotted position shown at 631[a]. Then, as the arm 682 moves to the right it carries the pawl 626 over a number of the ratchet teeth. When the arm 682 moves back to the left to its original position, it will drive the ratchet 627 forward by that number of teeth. As the winding roll 600 increases in diameter, the arm 632 is forced outward, as shown in full lines in Fig. 28, and the overhanging segment 631 moves to the left. Then when the oscillating arm 682 and its pawl 626 move toward the right, the pawl 626 will pass over the lesser number of ratchet teeth before it comes into contact with the segment 631, when it will disengage the teeth of the ratchet and slide on top of the segment 631. Now when the arm 682 moves again to the left it will not move the ratchet 627 until after the pawl passes off the segment 631 and again engages the ratchet teeth, and thus a lesser amount of rotation is given the ratchet 627. The arm 632 is so shaped that its changing contact points with the roll 600 will cause the proper amount of outward movement so that a predetermined amount of feed of the paper will remain constant with the change in diameters of the winding roll 600.

In order that the amount of feed may be more accurately controlled, in place of the ratchet 627 and the pawls 626 and 629 (Fig. 28) I prefer to use a friction wheel 627[a] and a pair of ball or roller positive friction clutches 649 and 651, as shown in Fig. 30. With this arrangement, the action of the segment 631 and its connecting arm 632 is substantially the same as above described.

Taking up now the oscillation of the arm 682 on its pivot which, as described above, through the various connections turns the winding roll 600, various methods may be employed to cause this movement. Referring principally to Figs 28 and 29, swivelled to the top of the arm 682 as at 640 by

means of a forked link 637 is an arm 641, the other end of which passes freely through a swivelled bushing 648 in an arm 644 which is swivelled in a small projection 647, shown also in Fig. 3, secured to the stationary machine frame 1. The swivel arrangement is made necessary because of the oscillating movement of the pad arms 7 and 8 on which the above-described mechanism is mounted and also because arm 7 at the end of the operation moves upward in relation to arm 8 and to all stationary parts. When the pad arms 7 and 8 oscillate and carry with them the feeding mechanism, the rod 641 slides backward and forward in its free bearing in the bushing 648. Adjustably positioned on the rod 641 is a collar 642 locked in position by a set screw 643. As the rod 641 moves with the pad arms 7 and 8 and the feeding mechanism to the right (Fig. 28), the collar 642 contacts with the end of the abutment arm 644. This will stop the movement of the rod 641 in relation to the abutment 644 which is stationary and will cause the collar 637 to push the oscillating arm 682 and its pawl 626 toward the left about its axis 630. Upon the return of the feeding mechanism to the left, the collar 651 and the shock spring 652 cause the arm 641 to be pulled to the left and returned to normal position. It will follow, therefore, that the amount of oscillation given to the arm 682 will depend upon the position in which the collar 642 is placed and its position may accordingly be adjusted to suit the amount of paper desired fed with each oscillation of the pad arms. The swivelled bushing 648 is stationarily secured to the frame of the machine and therefore does not partake of any movement of the pad arms; and when the arm 7 is moved upward in relation to the arm 8 after operation upon the hat, the feeding mechanism just described also moves upwardly and the shaft 641 is thrown at an angle, and the collar 642 is drawn upwardly so that in the movement of the arms the collar 642 does not come into contact with the abutment 644 and therefore the feeding ceases.

The feeding of the paper may be accomplished by dispensing with the contact with a stationary part, as 644, by a device such as is shown in Fig. 31. The movements of the oscillating arm 682 may be brought about by the action of its own inertia. As the roll 600 and the feeding mechanism oscillate with the pad arms, the arm 682 will oscillate about its axis due to its inertia and will strike alternately against stops 606^a and 606^b which are secured to the bracket 606 of Figs. 23 and 24. By adjustment of a set screw 609 and a check nut 608 (Fig. 31) the length of the oscillations of the arm 682, and therefore the amount of paper fed with each oscillation, may be regulated. In this instance an arm 654 is pivoted on the lower pad arm 8 (not shown in Fig. 31) and an extension 630^a of the rod 630 slides in a slot in an enlarged portion 653 of the arm 654 to act as a guide. When the arm 7 is raised upwardly in relation to arm 8 and the feeding mechanism moves with it the spring 652 draws the arm 624 over against stop 606^b and holds it there, although the pad arms may continue to oscillate and thus the feeding of the paper ceases.

In the above-described sand paper feed driving mechanism described with regard to Figs. 28 to 31, the feed occurs at each oscillation of the pad arms 7 and 8. It is preferably, however, and necessitates less gearing to reduce the drive to have the feed of the sand paper occur either at the beginning or at the end of the operation upon the hat when the arm 7 moves toward or away from the arm 8. A mechanism of this nature has already been described with regard to Figs. 11 and 12, wherein the sand paper strip is fed across the pad and then torn off without being wound on a receiving roll. In Fig. 32 is shown a similar mechanism applied to rotating a receiving roll 600 and its action may be readily understood by reference to the description of Figs. 10 and 11 since the same reference numerals have been used to indicate the similar parts. With this latter construction, if desired, the worm 619 and the worm wheel 611 may be eliminated as the reduction of movement is not required that is made necessary when the ratchet wheel 627 moves with every oscillation of the pad arm. The axis of the ratchet 627 may coincide with the axis of the receiving roll 600.

With regard to the mounting of the sand paper roll 500 upon the pad arm in the position shown in Fig. 10, the roll is preferably mounted in a universal mounting upon the stud 504 of the pad casting 7, as already described with regard to the roll 500 (Figs. 17, 18 and 19). Since the roll 500 in this position oscillates with the pad arms it is desirable to provide a brake upon the roll to prevent its unwinding too rapidly. This may be accomplished by the use of a brake arm 244 (Fig. 10) pivoted upon the casting 204, as at 246, and drawn against the surface of the roll, as by a spring 245. In Fig. 16 the roll 500 is shown provided with a different form of brake, as 248, mounted upon the axis of the roll and held against the surface of the same by a spring 249.

Referring now to Fig. 33, there is shown a perspective view of a brim-pouncing machine equipped with manual means for separating the arms 7 and 8 in place of the automatic separating mechanism above described with regard to Figs. 7 and 8. The rod 73 passing up through the tubular bear-

ing shaft 71 and connected by the pin 65 to the upper pad arm 7 (Fig. 2) is connected at its lower end to a foot lever 47, as at 47b (Fig. 33), the lever 47 being swivelled on the frame 1 as at 47a. The upright rod 73 partakes of a slight oscillating movement with the pad arm 7 because of the pin connection 65 and therefore the connection between the bottom of the rod 73 and the foot lever 47 must be such that it can swivel. To provide for this, the lower end of the rod 73 rests in a cup-like recess in the foot lever 47 and a spring 93 draws the two together, always keeping them in engagement. A downward pressure upon the lever 47 through the pin connection 65 raises the arm 7 away from the arm 8 and separates the pads 15 and 16. In this construction there is provided a rocker arm 31, clearly shown in Figs. 2 and 3, swivelled on the frame 1 at 31a and having a spring 63 tending to pull it around toward the axis of the bearing shaft 71. When the rod 73 is pushed upward due to a pressure on the foot lever 47 and carries the arm 7 with it, the rocker arm 31 swings by action of the spring 63 and passes between the lower face of the arm 7 and the frame bearing 9, forking around the shaft 71 until its handle 31b comes in contact with a stop 102 and holding the arm 7 in this raised position away from the arm 8. The arm 7 thus remains in raised position holding the pads 15 and 16 apart until the arm 31 is drawn outward by its handle 31b. Fig. 33 also shows diagrammatically the means of supplying sand paper strips to the pad faces which comprises drawing the strip from a supply roll 500 across the pad and onto a receiving roll 600.

It will be readily understood that the above-described automatic means and manual means for arresting the operation of the machine are readily interchangeable, as are the various methods of applying and feeding the abrasive strip to the operating surfaces of the pads without extensive alteration of the construction and operation of the machine in general. Various combinations of these mechanisms may be employed as desired to meet the varying requirements of practical operation.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiments above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim as my invention:

1. In a machine of the class described, in combination, a pair of reciprocating pouncing pads adapted to pounce the brim of an oval hat having a hat block fitted within the crown thereof, feed rollers adapted to grip the brim of said hat and rotate said hat to feed said brim through between said pads, and means for rotatably supporting said hat comprising a support upon which said hat block is adapted to rest and rotate, said support having a part adapted to enter a central recess in the bottom of said hat block to center said hat for rotation and being movable toward and away from said pads, and means yieldingly urging said support with said hat block and said hat thereon toward said pads.

2. In a hat pouncing machine, in combination, a pivoted lever, means carried upon said lever adapted to pounce a hat, a driven shaft having an eccentric portion, and a box-like member rotatably mounted upon said eccentric portion and comprising a reservoir for lubricant, said pivoted lever having a hollow portion adapted to form a reservoir for lubricant and slidably passing through said box-like member, coacting therewith to oscillate said lever about said pivot and actuate said hat pouncing means, the interior of said hollow portion of said lever being in communication with the interior of said box-like member and with said pivot.

3. In a hat pouncing machine, in combination, a tubular bearing shaft, a pair of levers pivoted thereon, means upon said levers adapted to receive a portion of a hat therebetween to operate thereon, means for oscillating said levers about said tubular bearing, and means passing through said tubular bearing adapted to engage one of said levers to move the same relative to said other lever.

4. In a hat pouncing machine, in combination, a tubular bearing shaft, a pair of levers pivoted upon said shaft, means upon said levers adapted to receive a hat brim therebetween to operate thereon, means for moving said levers to operate upon said hat brim, and means within said tubular shaft projecting through a slot therein for moving one of said levers relative to the other.

5. In a hat pouncing machine, in combination, a pair of oppositely disposed members adapted to receive a hat brim therebetween to operate thereon, means for actuating said members to operate upon the hat brim, and automatic means for separating said members to arrest said operation upon the hat brim upon completion of a predetermined amount of work thereon.

6. In a hat pouncing machine, in combination, a pair of members adapted to receive a hat brim therebetween to engage the same and operate thereon, means adapted to actuate said members to operate on the hat brim, and resilient means adapted automatically to separate said members to

release said hat brim upon completion of a predetermined amount of work thereon.

7. In a machine of the class described, in combination, means adapted to support a hat, a tool adapted to operate upon the brim of said hat, a driven member upon which said tool is mounted, a tubular bearing for said driven member, and means within said tubular bearing adapted to engage said driven member for moving said tool thereon out of engagement with said hat.

8. In a machine of the class described, in combination, a bearing shaft, a pair of levers mounted upon said bearing shaft one above the other, a pair of tools mounted upon said two levers and adapted to receive a hat brim therebetween to operate thereon, and means passing through said bearing shaft and engaging said upper lever for raising said lever and lifting said tool thereon out of engagement with said hat brim.

9. In a hat pouncing machine, in combination, means for operating upon a hat brim, means for rotatably supporting the hat in operative relation to said operating means, a pair of separable rollers adapted to grip the brim and feed it through said operating means, and means adapted automatically to separate said rollers upon the completion of a predetermined amount of operation on the hat brim.

10. In a hat pouncing machine, in combination, means for operating upon a hat brim, means for rotatably supporting the hat in operative relation to said operating means, a pair of separable rollers adapted to grip the brim and feed it through said operating means, said rollers being pivotally mounted with respect to each other and adapted to be swung apart to permit insertion or removal of the hat brim, and means adapted automatically to separate said rollers upon the completion of a predetermined amount of operation on the hat brim.

11. In a hat pouncing machine, in combination, a pair of oppositely disposed members adapted to receive a hat brim therebetween to engage the same and operate thereon, means for rotatably mounting the hat in operative relation to said members, a pair of rollers positioned adjacent said members and adapted to grip the hat brim and feed it between said operating members, and automatic means for simultaneously separating said operating members to disengage said hat brim and for separating said feed rollers to disengage said hat brim upon the completion of a predetermined amount of operation thereon.

12. In a hat pouncing machine, in combination, a pair of oppositely disposed members adapted to receive a hat brim therebetween to engage the same and operate thereon, means for rotatably mounting the hat in operative relation to said members, a pair of rollers positioned adjacent said members and adapted to grip the hat brim and feed it between said operating members, and automatic means for separating said operating members to disengage said hat brim upon the completion of a predetermined amount of operation thereon.

13. In a machine of the class described, in combination, means for rotatably supporting a hat, a tool adapted to operate upon the brim of said hat, means adapted to rotate said hat to feed the brim thereof past said operating means, means for lifting said tool out of engagement with said rotating hat brim, and automatic means adapted to actuate said last means upon completion of a predetermined amount of operation upon said hat brim.

14. In a machine of the class described, in combination, means for rotatably supporting a hat, a tool adapted to operate upon the brim of said hat, means adapted to grip the brim of said hat and to rotate said hat to feed said brim past said operating means, means for releasing said gripping means, and automatic means adapted to actuate said last means upon completion of a predetermined amount of operation upon said hat brim.

15. In a machine of the class described, in combination, means for rotatably supporting a hat, a tool adapted to operate upon the brim of said hat, means adapted to grip the brim of said hat and to rotate said hat to feed said brim past said operating means, means for lifting said tool out of engagement with said rotating hat brim, means for releasing said gripping means, and automatic means adapted to actuate said last two means substantially simultaneously upon completion of a predetermined amount of operation upon said hat brim.

16. In a hat pouncing machine, in combination, a pouncing tool adapted to operate upon a hat brim, a reciprocating member for carrying said tool, a pivotal connection between said tool and said carrying member to permit said tool to adjust its plane to that of said hat brim, and compression springs interposed between said tool and said carrying member on either side of said pivot.

17. In a machine of the class described, in combination, means adapted to support a hat, a pouncing pad adapted to bear upon and pounce the brim of said hat, means for moving said pad out of engagement with said brim and including a slidable member, and adjustable spring means acting through said slidable member adapted to determine the bearing pressure of said pad against said brim.

18. In a machine of the class described, in combination, means adapted to support a

hat, a pouncing pad adapted to bear upon and pounce the brim of said hat, means for moving said pad out of engagement with said brim, and a pair of adjustable springs acting through said means, one of said springs tending to increase the pressure of said pad against said brim and the other tending to decrease said pressure.

19. In a machine of the class described, in combination, means adapted to support a hat, a pouncing pad adapted to bear upon and pounce the brim of said hat, means for moving said pad out of engagement with said brim and including a slidable member, and a pair of adjustable compression springs acting through said slidable member, one of said springs tending to increase the pressure of said pad against said brim and the other tending to decrease said pressure.

20. In a machine of the class described, in combination, means adapted to support a hat, a pouncing pad adapted to bear by gravity upon the brim of said hat and to pounce said brim, a substantially upright slidable rod for lifting said pad out of engagement with said brim, spring means acting through said rod for determining the pressure of said pad upon said brim, and means for adjusting said spring means to increase or decrease said pressure.

21. In a machine of the class described, in combination, means adapted to support a hat, a pouncing pad adapted to bear by gravity upon the brim of said hat and to pounce said brim, a substantially upright slidable rod for lifting said pad out of engagement with said brim, an adjustable compression spring acting upon said rod and tending to lift said pad against the force of gravity, and an adjustable compression spring acting upon said rod and tending to supplement the force of gravity upon said pad.

22. In a machine of the class described, in combination, a bearing shaft, a pair of levers mounted upon said bearing shaft one above the other, a pair of tools mounted upon said two levers and adapted to receive a hat brim therebetween to operate thereon, means passing through said bearing shaft and engaging said upper lever for raising said lever and lifting said tool thereon out of engagement with said hat brim, spring means acting through said last means for determining the pressure of said tool against said hat brim, and means for adjusting said spring means.

23. In a machine of the class described, in combination, a bearing shaft, a pair of levers mounted upon said bearing shaft one above the other, a pair of tools mounted upon said two levers and adapted to receive a hat brim therebetween and to operate thereon, a rod passing upwardly through said bearing shaft and slidable therein and having means adapted to engage said upper lever, means for raising said rod to raise said upper lever and lift the pad thereon out of engagement with said hat brim, and means for holding said lever in said raised position.

24. In a machine of the class described, in combination, a bearing shaft, a pair of levers mounted upon said bearing shaft one above the other, a pair of tools mounted upon said two levers and adapted to receive a hat brim therebetween and to operate thereon, a rod passing upwardly through said bearing shaft and slidable therein and having means adapted to engage said upper lever, means for raising said rod to raise said upper lever and lift the pad thereon out of engagement with said hat brim, and spring means acting through said rod for adjusting the pressure of said upper pad against said hat brim.

25. In a hat pouncing machine, in combination, a pair of reciprocating pouncing pads adapted to receive a hat brim therebetween and each having an abrasive strip, means for moving said pads relative to each other, and automatic means for feeding said abrasive strips as said relative movement occurs.

26. In a hat pouncing machine, in combination, a pair of reciprocating pouncing pads adapted to receive a hat brim therebetween and each having an abrasive strip, means for moving one of said pads away from the other, and automatic means actuated by said movement adapted to feed said abrasive strips.

27. In a machine of the class described, in combination, means adapted to support a hat, a pouncing pad adapted to operate upon said hat, a reciprocating support for said pad, a supply of abrasive material in strip form mounted upon a part which does not partake of the movements of said reciprocating support, and means for feeding said abrasive strip from said supply across the surface of said pad to reciprocate with said pad and form a pouncing surface therefor.

28. In a machine of the class described, in combination, means adapted to support a hat, a pouncing pad adapted to operate upon said hat, a reciprocating support for said pad, a supply of abrasive material in strip form mounted upon a part which does not partake of the movements of said reciprocating support, means for feeding said abrasive strip from said supply across the surface of said pad to reciprocate with said pad and form a pouncing surface therefor, and means for maintaining substantially taut said strip passing from said supply to said pad.

29. In a machine of the class described,

in combination, means adapted to support a hat, a pouncing pad adapted to operate upon said hat, a reciprocating support for said hat, a roll of abrasive material in strip form mounted upon a part which does not partake of the movements of said reciprocating support, means for feeding said abrasive strip from said roll across the surface of said pad to reciprocate with said pad and form a pouncing surface therefor, and a restraining brake acting upon said roll comprising a spring-pressed member bearing against the surface of said roll.

30. In a machine of the class described, in combination, a pair of reciprocating pouncing pads adapted to pounce a hat brim, feed rollers adapted to grip the brim of said hat and rotate said hat to feed said brim through between said pads, said hat having a hat block fitted within the crown thereof, and means for rotatably supporting said hat comprising a support upon which said hat block is adapted to rest and rotate, said support being movable toward and away from said pads and said feed rollers as the hat rotates.

31. In a hat pouncing machine, in combination, a pouncing pad, means adapted to support a hat in operative relation thereto, a rotatably mounted roll comprising an abrasive strip, means for feeding said abrasive strip across said pad, and means for adjusting said roll to aline its axis with the receiving side of said pad.

32. In a hat pouncing machine, in combination, a pouncing pad, means adapted to support a hat in operative relation thereto, a roll comprising an abrasive strip, means associated with said pad adapted to receive said abrasive strip from said roll and feed said abrasive strip to said pad, and means for automatically aligning the delivery side of said roll with said feeding means.

33. In a machine of the class described, in combination, means adapted to support a hat, a pouncing pad adapted to operate upon said hat, a reciprocating support for said pad, a supply of abrasive material in strip form mounted upon a part which does not partake of the movements of said reciprocating support, means adapted to draw said abrasive strip from said supply across the surface of said pad to form a pouncing surface therefor, and means upon said reciprocating pad adapted to guide said strip and hold said strip snugly against the surface of said pad.

34. In a hat pouncing machine, in combination, a pouncing pad, means adapted to support a hat in operative relation thereto, a roll comprising an abrasive strip, and driven means at either side of said pad adapted to feed said abrasive strip across said pad.

35. In a hat pouncing machine, in combination, a pouncing pad, means adapted to support a hat in operative relation thereto, a roll comprising an abrasive strip, and driven means mounted upon said pad at either side thereof adapted to feed said abrasive strip across said pad.

36. In a hat pouncing machine, in combination, a pouncing pad, means adapted to support a hat in operative relation thereto, a roll comprising an abrasive strip, and a pair of driven rolls adapted to receive said abrasive strip therebetween and feed it across said pad.

37. In a hat pouncing machine, in combination a pouncing pad, means adapted to support a hat in operative relation thereto, an abrasive strip, and a pair of driven rolls having yielding surfaces adapted to receive said abrasive strip therebetween and feed it across said pad.

38. In a hat pouncing machine, in combination, a pouncing pad, means adapted to support a hat in operative relation thereto, a roll comprising an abrasive strip, a pair of rolls at one side of said pad adapted to guide said abrasive strip thereto, and a pair of driven rolls at the opposite side of said pad adapted to receive said abrasive strip therebetween and to draw said abrasive strip across said pad.

39. In a hat pouncing machine, in combination, a pouncing pad, means adapted to support a hat in operative relation thereto, a roll comprising an abrasive strip, driven means at one side of said pad adapted to draw said abrasive strip thereto, and driven means at the opposite side of said pad adapted to draw said strip from said first driven means across said pad.

40. In a hat pouncing machine, in combination, a pouncing pad, means adapted to support a hat in operative relation thereto, a roll comprising an abrasive strip, driven means at one side of said pad adapted to draw said abrasive strip thereto, and driven means at the opposite side of said pad adapted to draw said strip from said first driven means across said pad, said two driven means being driven in unison.

41. In a hat pouncing machine, in combination, a pouncing pad, means adapted to support a hat in operative relation thereto, an abrasive strip, a pair of rolls at one side of said pad adapted to draw said abrasive strip thereto, and a pair of rolls at the opposite side of said pad adapted to draw said abrasive strip from said first rolls across said pad, the diameter of said second pair of rolls being greater than that of said first pair of rolls.

42. In a hat pouncing machine, in combination, a pouncing pad, means adapted to support a hat in operative relation thereto, an abrasive strip, a driven roll at one side

of said pad, and a roll coacting with said first roll said abrasive strip being adapted to be gripped between said two rolls and drawn across said pad thereby.

43. In a hat pouncing machine, in combination, a pouncing pad including an abrasive strip, means adapted to support a hat in operative relation to said pouncing pad, means for feeding said abrasive strip across said pad, and a device over which the used portion of said strip may be torn off after traversing said pad.

44. In a hat pouncing machine, in combination, a pouncing pad, means adapted to support a hat in operative relation thereto, a roll, an abrasive strip upon said roll, and a pair of spring-pressed rollers adapted to feed said abrasive strip across said pad.

45. In a hat pouncing machine, in combination, a pouncing pad including an abrasive strip, means adapted to support a hat in operative relation to said pouncing pad, a pair of spring-pressed rollers for feeding said abrasive strip across said pad, and means for releasing the spring pressure between said rollers.

46. In a hat pouncing machine, in combination, an oscillating pouncing pad, means adapted to support a hat in operative relation thereto, a roll comprising an abrasive strip, a pair of driven rolls mounted upon said pad and adapted to feed said abrasive strip across said pad, and means for adjusting the position of said driven rolls into substantial parallelism with the side of said pad.

47. In a hat pouncing machine, in combination, a pouncing pad having one end of substantially greater width than the other, means adapted to support a hat in operative relation to said pouncing pad, an abrasive strip, and means for feeding said abrasive strip over a side of said pad and across its surface.

48. In a hat pouncing machine, in combination, a pouncing pad having substantially parallel ends and a side obliquely disposed relative thereto, means adapted to support a hat in operative relation to said pouncing pad, an abrasive strip, and means for delivering said abrasive strip to said pad adapted to feed said strip over said side to engage substantially all portions of its surface and across the face of said pad in a direction in substantial parallelism with said parallel ends.

49. In a hat pouncing machine, in combination, a pouncing pad having a pair of non-parallel sides, means adapted to support a hat in operative relation thereto, an abrasive strip, delivering means for said abrasive strip positioned adjacent one of said sides, receiving means for said abrasive strip positioned adjacent the other of said sides, said strip being adapted to move from said delivering means over said one side across the face of said pad and over said other side to said receiving means, and means cooperating with said delivering means and said receiving means adapted to maintain of equal length the paths of travel of the side edges of said strip between said delivering means and said receiving means.

50. In a hat pouncing machine, in combination, a pouncing pad having non-parallel sides, means adapted to support a hat in operative relation thereto, an abrasive strip, a roll adapted to draw said abrasive strip across the face of said pad and over said non-parallel sides, and means for adjusting the position of said roll to maintain the side edges of said strip at substantially right angles to the axis of the roll and to maintain the path of travel of said strip in substantial coincidence with the surfaces of said sides and said face.

51. In a hat pouncing machine, in combination, a pouncing pad having an operating face, said face having a pair of substantially parallel sides and a third side obliquely disposed relative thereto, means adapted to support a hat in operative relation to said pouncing pad, an abrasive strip, and means adjacent said pad adapted to engage said abrasive strip and feed it across said face in a direction in substantial parallelism with said parallel sides, and over said third side.

52. In a hat pouncing machine, in combination, a pouncing pad having an operating face said face having a pair of non-parallel sides, means adapted to support a hat in operative relation to said pouncing pad, an abrasive strip, means for feeding said abrasive strip over one of said sides, across said face and over the other of said sides, and means coacting with said feeding means adapted to maintain the lines of travel of the plane of said strip in substantial coincidence with the planes of the said three surfaces over which it moves.

53. In a hat pouncing machine, in combination, a pair of pouncing tools adapted to receive therebetween the brim of a hat and to pounce said brim, means adapted to support a hat in operative relation to said tools with the brim thereof between said tools, means adapted to rotate said hat to feed the brim through between said tools, yielding means urging said hat toward said tools, and a member adapted to be interposed between the crown of the hat and the tool operating upon the upper side of said brim, said member being removable to an inoperative position.

54. In a hat pouncing machine, in combination, a pair of pouncing tools adapted to receive therebetween the brim of a hat and to pounce said brim, means adapted to support a hat in operative relation to said tools with the brim thereof between said

tools, means adapted to rotate said hat to feed the brim through between said tools, yielding means urging said hat toward said tools, and a member adapted to be interposed between the crown of the hat and the tool operating upon the upper side of said brim, to prevent the crown from moving against said tool under the urge of said yielding means, said member being pivotally mounted and capable of being swung out of operative position.

55. In a machine of the class described, in combination, a pair of reciprocating pouncing pads adapted to pounce a hat brim, feed rollers adapted to grip the brim of said hat and rotate said hat to feed said brim through between said pads, said hat having a hat block fitted within the crown thereof, and means for rotatably supporting said hat comprising a support upon which said hat block is adapted to rest and rotate, said support comprising an upwardly extending member pivoted at its lower end to swing toward and away from said pads and said feed rollers as the hat rotates and having means for engaging with the hat block to center the latter for rotation.

56. In a machine of the class described, in combination, a pair of reciprocating pouncing pads adapted to pounce a hat brim, feed rollers adapted to grip the brim of said hat and rotate said hat to feed said brim through between said pads, said hat having a hat block fitted within the crown thereof, and means for rotatably supporting said hat comprising a support upon which said hat block is adapted to rest and rotate, said support comprising an upwardly extending member pivoted at its lower end to swing toward and away from said pads and said feed rollers and having at its upper end a part against which the bottom surface of the hat block rests and the part adapted to enter a central recess in the underside of the hat block, and means yieldingly urging said supporting member to swing toward said pads and to hold the hat brim in position between the pads during the pouncing operation.

57. In a hat pouncing machine, in combination, a reciprocating arm having a pouncing pad, means for supporting a hat to be operated upon by said pouncing pad, an abrasive strip, a pair of rollers mounted upon said arm at one side of said pad adapted to grip said strip and draw the same across the pad surface, and means mounted upon said arm at the opposite side of said pad adapted to grip said strip and feed it to said rollers and coact with said rollers to hold said strip taut against the face of the pad during operation upon the hat.

58. In a hat pouncing machine, in combination, means for supporting a hat, a reciprocating arm having a pouncing pad adapted to operate upon said hat, said arm being mounted for movement into and out of engagement with said hat, an abrasive strip, a pair of rollers positioned on said arm at one side of said pad adapted to grip said strip and draw it across the pad surface, a second pair of rollers positioned on said arm at the other side of said pad adapted to grip said strip and feed it to said first rollers, and means adapted to actuate both of said pairs of rollers when said arm is moved to carry said pad out of engagement with the hat.

In testimony whereof, I have signed my name to this specification this twenty-sixth day of June, 1922.

JAMES F. DORAN.