(No Model.) 4 Sheets—Sheet 1.

R. EICKEMEYER, Dec'd.

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HAT OR FELT POUNCING MACHINE.

No. 565,158. Patented Aug. 4, 1896.

Fig. 1.

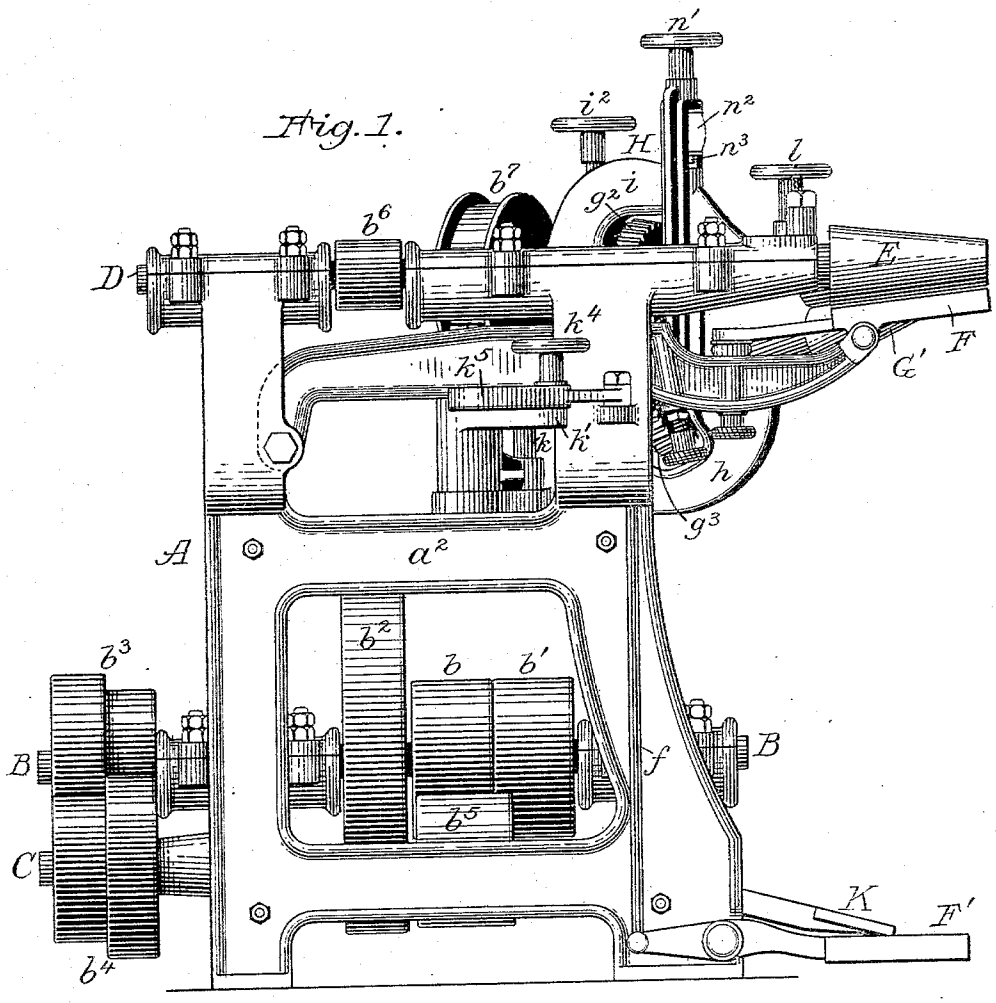

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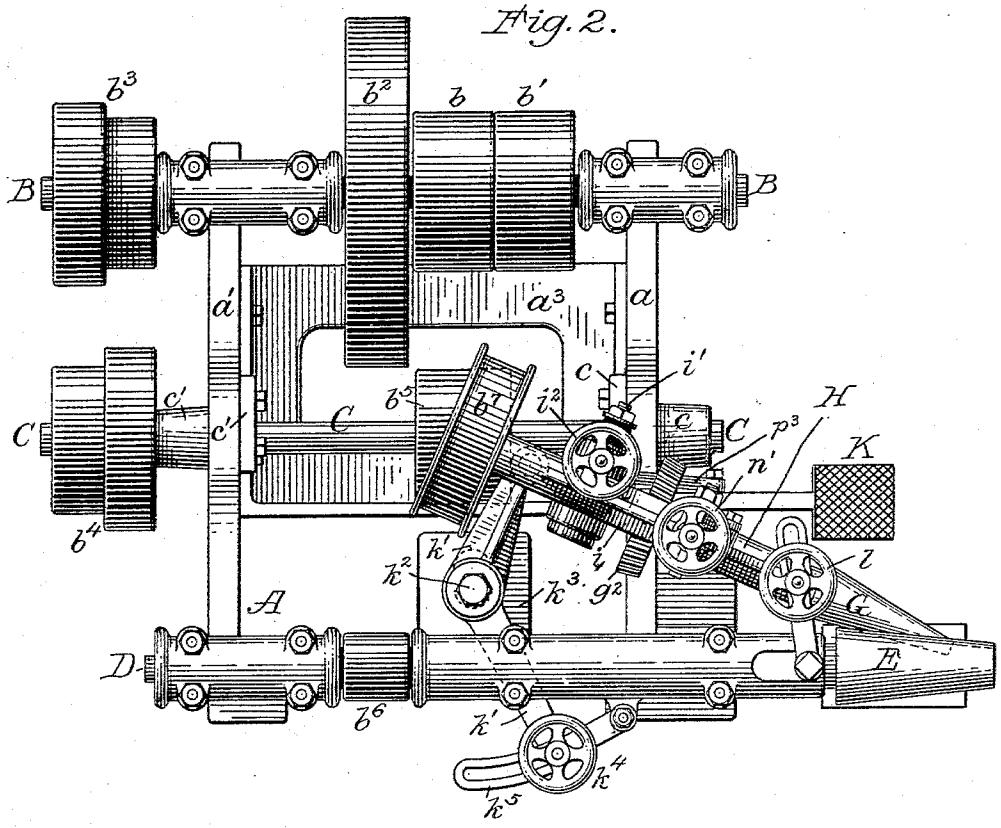
Fig. 2.



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(No Model.) 4 Sheets—Sheet 3.

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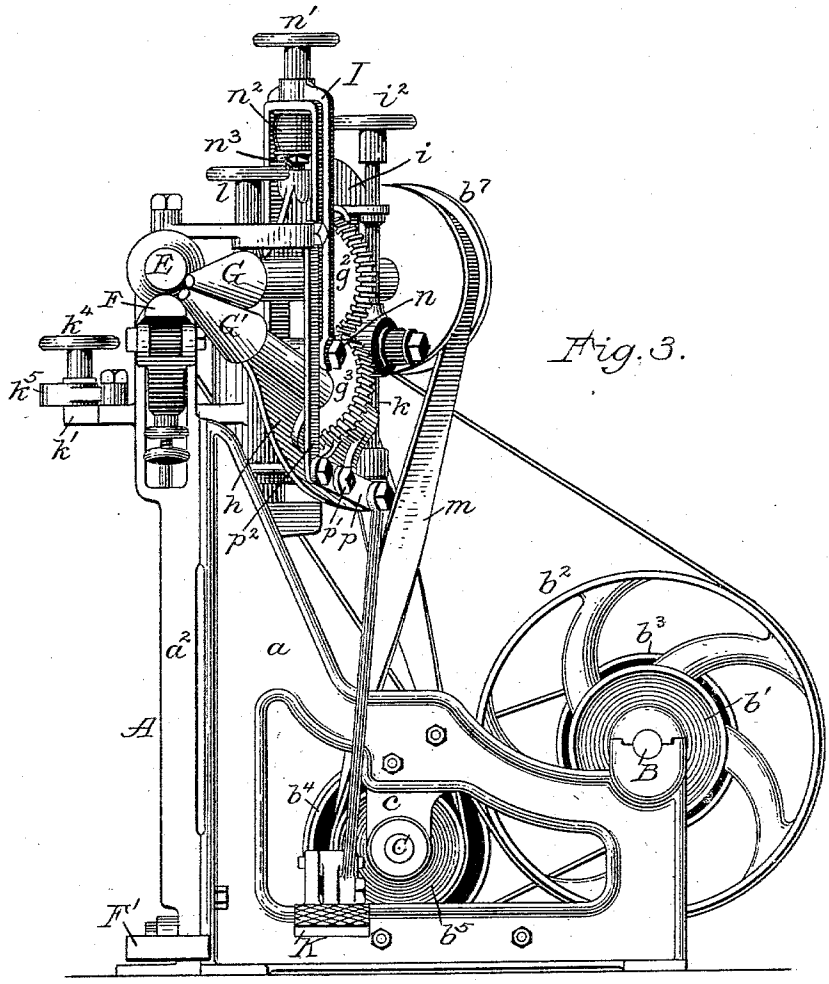

Fig. 3.

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(No Model.) 4 Sheets—Sheet 4.

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HAT OR FELT POUNCING MACHINE.

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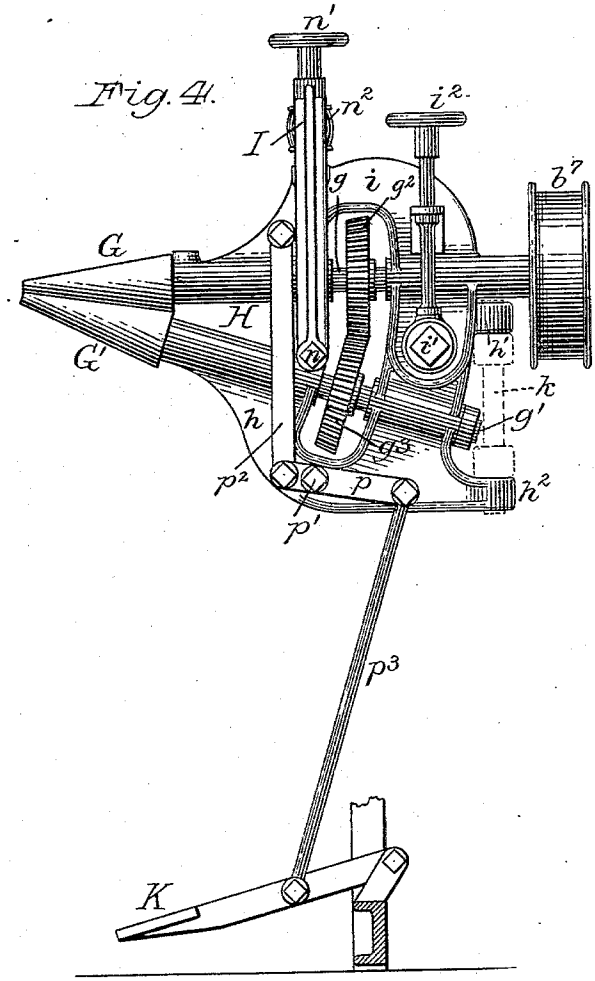
Fig. 4.



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UNITED STATES PATENT OFFICE.

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HAT OR FELT POUNCING MACHINE.

SPECIFICATION forming part of Letters Patent No. 565,158, dated August 4, 1896.

Application filed October 31, 1893. Serial No. 489,637. (No model.)

To all whom it may concern:

Be it known that I, RUDOLF EICKEMEYER, of Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Hat or Felt Pouncing Machines; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of my invention.

The object of my present improvements is to provide a highly efficient pouncing-machine for securing, in a better manner, certain practical results attainable in the use of pouncing-machines as heretofore devised and patented to me, and my invention involves a reorganization of the several essential elements of said machines.

For clearly indicating the status of my said improvements I will refer to such of my Letters Patent as will afford a reliable knowledge as to the prior art with special reference to the class of pouncing-machines to which my present improvements pertain.

In a machine disclosed in my Letters Patent No. 148,680 the pouncing-cylinder and the feed-rolls were mounted upon a bed-plate adapted for service on a bench or table, and said pouncing-cylinder and feed-rolls were arranged to be operated by separate belting, and driven either from a floor-shaft beneath the bench or an overhead shaft suspended from the ceiling of a room. The feed-rolls in said machine were mounted in a feed-roll frame hinged at its inner end upon a movable vertical pivot rod or stud, and thus secured to the bed-plate, so that the rolls could be swung laterally and moved longitudinally, and the two feed-roll shafts were directly geared together. In another machine, disclosed in my Letters Patent No. 240,311, the pouncing-cylinder and feed-rolls were mounted in a main frame, which also contained a main driving-shaft from which the pouncing-cylinder and feed-rolls were driven by belts, but in said machine the feed-roll shafts were not directly geared together, but involved the use of intermediate idler-gears, and the feed-roll frame, although capable of longitudinal movement, was not hinged to the main frame, (as in the first machine referred to,) and the belting from the main shaft was applied to a counter-shaft from which power was communicated to the feed-rolls by gearing.

In my new machines I have so organized the working elements in and with a main frame as to secure the advantages due to the hinged feed-roll frame, the direct gearing of the two feed-roll shafts, and the direct driving of one feed-roll shaft by a belt without intermediate gearing, the machine as a whole being quite compact and highly efficient.

In neither of the prior machines referred to was any provision made for so separating or opening the feed-rolls as to enable the ready and accurate placing of a hat-body therein before allowing the rolls to assume control over it. In still another machine, however, this provision was made by me, as disclosed in my Letters Patent No. 182,908, wherein reciprocating pouncing-plates were employed instead of a revolving pouncing-cylinder. In this last-named machine the feed-rolls were directly geared together, and one feed-roll shaft was driven by gearing from a vertical shaft, and the feed-roll frame was hinged at its inner end upon vertical pivots, so as to operate in that respect as in the machine of Patent No. 148,680. The upper feed-roll shaft in said machine had its bearings in an upper frame-arm, which at its inner end was hinged to a lower arm on a horizontal transverse pivot, these two arms constituting a feed-roll frame, and the feed-rolls were separated by means of a treadle and a thrust-rod connected to an outer portion of the feed-roll frame. A similar thrust-rod from the same treadle also simultaneously lifted the upper pouncing-plate head from the lower plate. In that machine the biting effect of the feed-rolls was due to a weight carried by the upper arm, and the lifting or opening movement of the feed-rolls by way of the treadle had therefore no adverse effect upon the vertical hinge-bearings by which the feed-roll frame was mounted on the main frame. In the machine of Patent No. 148,680 the biting effect of the feed-rolls was secured by means of a heavy spring interposed between the upper arm of the feed-roll frame and the under side of a strap-link which was pivoted to the lower arm; and,

therefore, however the spring might be adjusted, the action of said feed-rolls was variable, in that they would engage more firmly with a thick hat-body or piece of felt than with a thin one, as distinguished from the weight-controlled feed-rolls, which action was of course constant or non-variable. This variable biting action of the feed-rolls is of practical value in a pouncing-machine, and hence in my present machine I employ the aforesaid strap-link and spring, and for separating the feed-rolls for the introduction of a hat-body the power of that spring must be overcome, however heavily adjusted the spring may be.

It is now to be understood that the vertical rod or stud on which the feed-roll frame is hinged is a movable stud on an arm which is in turn pivoted to the main frame, and that to lift the upper arm of the feed-roll frame by means of a treadle and a thrust-rod connecting the treadle with the upper arm of said frame, as in the machine of my Patent No. 182,908, would involve a lifting strain upon the lower arm by way of the connecting-strap and spring, and a consequent lateral and rearward straining of the vertical hinge-joint, as well as of the second pivotal connection, by which the vertical stud is connected with the main frame, and all of this must have first occurred before the upper roll could be lifted at all, because that movement is only possible during the actual compression of the spring. This frequent upward to-and-fro straining of the hinged and pivoted connections would be conducive not only to objectionable vibrations, because the machine is operated at very high speed, but it would also tend to undue wear, and to loosen the bearings at said hinged or pivoted connections, and hence I have now so organized treadle mechanism that the rolls can be separated without any upward strains upon the lower arm of the feed-roll frame, and without varying the supporting relations of either the hinged bearings with respect of their vertical stud or of the pivotal connection by which said stud is rendered movable for longitudinally varying the position of the feed-rolls. In other words, I have now mounted on the lower arm of the feed-roll frame a lever which at one end is connected to the upper arm by a thrust bar or link, and at the other end said lever is connected with a treadle by means of a draft rod or link, so that the downward pressure on the treadle is borne by the lower arm of the feed-roll frame while the upper arm is being forced upwardly against the spring, thus effecting prompt separation of the feed-rolls without changing the straining relations at the hinged or pivoted connections between the feed-roll frame and the main frame.

After describing one of my improved machines in detail the features deemed novel will be duly specified in appropriate clauses of claim hereunto annexed.

Referring to the drawings, Figure 1 illustrates one of my improved pouncing-machines in end elevation. Fig. 2 is a top view of the same. Fig. 3 is a front side elevation of the same. Fig. 4 is a side view of the feed-rolls and their frame detached from the main frame and with the treadle and its draft-rod in position.

The main frame A of the machine somewhat resembles the frames of certain of my prior machines in that it embodies two side plates *a a'*, each of which is much higher at one end than at the other. These plates are firmly coupled by means of bolts and a front end plate a^2 and a base tie-plate a^3, (clearly shown in Fig. 2), said frame being specially strong and rigid, in view of the high speed at which such machines are operated. The side plates at their narrow or low ends afford box-bearings for a main driving-shaft B, carrying driving belt-pulleys, fast and loose, as at *b* and *b'*, also a large belt-pulley b^2, and at one end, outside of the adjacent side plate, there are smaller cone-pulleys b^3. A counter-shaft C has its bearings in rigidly-mounted hangers *c c'*, suspended from the two side plates, said shaft being parallel with the main shaft, but in a lower plane, and it carries at one end cone belt-pulleys b^4 in line with the other cone-pulleys b^3, and it also has a broad-faced belt-pulley b^5 centrally located thereon. Another shaft D carries at one end a pouncing-cylinder E, the latter being projected laterally beyond the front side plate *a* of the main frame.

The pouncing-cylinder shaft D has extensive box-bearings afforded by the top of the front end frame-plate a^2 and is provided with a small belt-pulley b^6, which is driven from the large pulley b^2 on the main driving-shaft, thus providing for operating the pouncing-cylinder E at high speed.

Beneath the pouncing-cylinder there is a hat or felt support or pouncing-bed F, which is controlled by a treadle F' and thrust-rod *f*, with respect of its movements toward and from the pouncing-cylinder, substantially as in the machine of my Letters Patent No. 148,680, the same old means for angularly adjusting the bed and also for restricting its upward movement being here employed, and hence they need not be specially described.

The pair of feed-rolls G G' coöperate with the pouncing-cylinder E, substantially as in my old machine of Patent No. 148,680, but their reorganization in this machine involves a novel combination and arrangement of feed-roll-driving mechanism and also a novel combination and arrangement of treadle mechanism for promptly opening or separating the feed-rolls for enabling the ready introduction of a hat-body or of such flat felt disks as are now employed in the manufacture of certain styles of ladies' and children's hats. The feed-rolls have shafts *g* and *g'*, which are carried in a feed-roll frame H, which is separately shown in Fig. 4. This frame consists of a lower arm *h* and an upper arm *i*. The

lower arm h has bearings in which the feed-roll shaft g' is journaled, and at its rear end said arm is provided with a pair of vertical hinge ears or lugs h' h^2. The upper arm i at its rear end is hinged to the lower arm, as at i', by means of a horizontal lateral pivot, which is vertically adjustable by means of the hand-wheel bolt i^2, as in the old machine of Patent No. 148,680.

The feed-roll frame as a whole is hinged to the main frame by means of the hinge-ears h' h^2 and a vertical rod or stud k, which is movable in that it is carried upon the inner end of a horizontal elbow plate or arm k', which is in turn centrally pivoted upon a stud at k^2, mounted upon a bracket k^3, projecting inwardly from (and as a part of) the front end plate a^2 of the main frame. The outer end of the elbow-plate k' is provided with a hand-wheel screw-clamp at k^4, which engages with a pivoted segmental slotted locking-plate k^5, thus providing for advancing or retiring the feed-roll frame longitudinally, as in my old machine of Patent No. 148,680; another pivoted locking-plate and hand-wheel nut at l, provided for adjusting the outer end of the feed-roll frame toward and from the pouncing-cylinder, also as in said old machine.

The two feed-roll shafts g g' are directly coupled together by the two gear-wheels g^2 g^3, as in my old machine of Patent No. 148,680, and, as in said machine, the upper shaft carries a belt-pulley at its inner end, but instead of being arranged to be driven by belting from a shaft remote from the machine this belt-pulley b^7 is located above the broad-faced belt-pulley b^5 on the counter-shaft C, and the two are operatively connected by a crossed belt m. This novel organization of the directly-geared feed-roll shafts, their frame, the counter-shaft, and these belt-pulleys provides for a perfect transmission of power to the feed-rolls, regardless of the necessary longitudinal and lateral variations in the position of said frame with reference to the main frame. As will be seen in Fig. 2, the feed-roll belt-pulley b^7 overlies the wide-faced counter-shaft pulley b^5, and that however varied in position the feed-roll frame may be the relations of the belt m to its two pulleys will remain substantially the same. The co-operating sets of cone-pulleys b^3 and b^4 on the counter-shaft and main shaft provide for varying the speed of the feed-rolls, which is a matter of material consequence, inasmuch as certain lines of felted goods may with safety be much more rapidly presented to the pouncing-cylinder than other kinds of goods, whereas in my old machines but one rate of feeding speed was provided for.

As thus far described, no mention has been made of the means which cause the feed-rolls to forcibly bite upon and take feeding control of an interposed hat-body or other piece of felted material. It is important that these rolls should operate under yielding pressure, and this has heretofore been provided for in some of my prior machines by means of weights, as in my Letters Patent No. 182,908, and in others by means of springs, as in my Letters Patent No. 148,680.

In my present machine I employ spring-controlled feed-rolls, because they operate variably in biting harder upon a thick body of felt than upon a thinner body, this being desirable in view of the fact that the pouncing-cylinder in ordinary operations will be made to more forcibly engage with a thick piece or portion of felt than with a thin piece or portion, the usual stop adjustment of the pouncing-bed being such as to secure proper pouncing of the thinnest piece or portion of felt to a predetermined thickness, it being well known that in hat-bodies, for instance, some portions thereof are considerably thicker than other portions, and also that similar variations occur in other felted goods, not only in the same piece, but as between separate pieces of the same lot, all of which had been made as nearly alike as was practicable.

As clearly shown in the drawings, and especially in Figs. 3 and 4, the lower arm h of the feed-roll frame carries a vertical strap-link I, which overlies the upper arm i of said frame and is pivoted at n to the two sides of lower arm. A hand-wheel bolt n' occupies a hole in the top of the strap and is at its lower end provided with a suitable seat on top of the upper arm i. On the bolt n' a heavy rubber spring n^2 is carried, which at its top abuts against the under side of the overlying top of the strap-link I and has its seat on a washer adjustably supported by a nut n^3 on a threaded portion of the bolt n', so that by turning this nut one way or the other the spring will be caused to bear with greater or lesser force upon the upper arms, or, otherwise stated, cause the upper feed-roll to variably bear upon the lower roll or upon interposed bodies of felt to be pounced. It is now to be understood that this organization of the strap-link and the spring is the same as was employed in my old machine of Patent No. 148,680, but in that machine no provision was made for opening or separating the feed-rolls except as a matter of mere adjustment, whereas in my present machine I have the same capacity for adjustment, coupled with means for promptly separating or opening and closing said feed-rolls, so that hat-bodies or pieces of felt of various forms may be readily and promptly inserted between the rolls and removed therefrom. A similar special control of the feed-rolls was provided for by me in the machine disclosed in my Letters Patent No. 182,908, but in that machine vibratory pouncing-plates were employed instead of a pouncing-cylinder, and in that machine, as hereinbefore stated, the feed-rolls were forced together by means of a weight instead of a spring, and for that reason it was practicable to lift the upper roll, its shaft, and feed-roll arm by means of a treadle connected directly

with said upper arm by a thrust rod or link, and another similar rod from the same treadle simultaneously lifted the upper pouncing-plate and its head from the lower plate.

As hereinbefore indicated, the lifting of a weight-controlled feed-roll-frame arm by means of a treadle and a thrust-rod directly connected with said frame-arm involves a different mode of operation from what would result with an upper arm controlled by a spring, as described, because in the one case the upper arm and its weight can be lifted and lowered without in any manner straining the lower arm and its hinged connections at the vertical movable rod or stud. On the other hand, with the spring-controlled arm and a direct lifting connection, as between the treadle, the thrust-rod, and the upper arm, no lifting action could occur, except in proportion as the already heavily-adjusted spring might be compressed, and such compression could not occur at all until after the lower arm had been fully and heavily strained upwardly, with a resulting variation in the supporting relations of the vertical hinge-joint on the movable rod or stud. During such changes, the machine being in rapid operation, serious objectionable vibration of the feed-roll frame and its several hinged or pivotal connections would inevitably be encountered, and hence the frequent intermitting variations in thus straining the entire feed-roll frame and varying the relations at its hinged connections would involve not only a useless expenditure of force at the treadle, but also undue wear and tear of the machine. It will be obvious that any undue vibration of the feed-rolls, due to undue wear or straining at the hinged connections, would, while in service, be conducive to irregular operation by the pouncing-cylinder and a more or less irregular surface on the felt pounced.

In my present machine, as specially shown in Fig. 4, the lower feed-roll-frame arm h carries a lever p, pivoted at p' and coupled at its short arm with the upper frame-arm i by a thrust rod or link p^2, and the long end of the lever p is connected with the treadle K by a draft rod or link p^3. With this novel organization all pressure on the treadle is borne by the lower arm of the feed-roll frame, and the leverage is such that the upper arm is promptly and easily lifted against the action of its spring, however heavily it may have been adjusted, and the feed-roll frame as a whole is even more solid, firm, and fixed with respect of its relations to the main frame during the lifting and lowering movements of the upper arm than it is while no pressure is applied to the treadle.

My improved machine is quite compact and is specially durable. It is highly efficient as to its capacities for performing good work, for rapid operation, and for variations in service; also as to the saving of time in accurately placing hat-bodies or other felted material within control of the feed-rolls, and in removing the same therefrom; and, still further, while being operated at specially high speed there is a minimum of vibration and little liability of its several adjusting connections becoming loosened.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a hat-pouncing machine, the combination in a suitable frame, of a conical pouncing-cylinder and its shaft mounted in the upper portion of said frame; a counter-shaft located in the lower part of said frame; a feed-roll frame hinged on a vertical pivot at its rear end above the counter-shaft; a pair of conical feed-rolls on shafts one above the other, carried in said hinged frame and directly coupled by gearing; a pulley on the inner end of the upper feed-roll shaft, overlying and directly belted to the counter-shaft, and a main shaft belted directly with the counter-shaft, and with the pouncing-cylinder shaft, substantially as described.

2. In a pouncing-machine, a main frame; a feed-roll frame hinged upon a vertical stud at its inner end to the main frame, and consisting of an upper and a lower arm coupled together near said hinge-stud by a horizontal lateral hinge-joint; a strap-link attached to the lower arm, and overlying the upper arm, and a controlling-spring interposed between the top of said strap and the upper arm, in combination with a lever pivoted to the lower arm of the feed-roll frame, and pivotally connected at one end, to the upper arm of said frame by means of a thrust-bar, and a treadle, connected with the other end of said lever, by means of a draft-link, substantially as and for the purposes specified.

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