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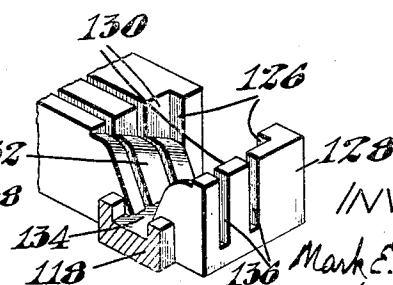
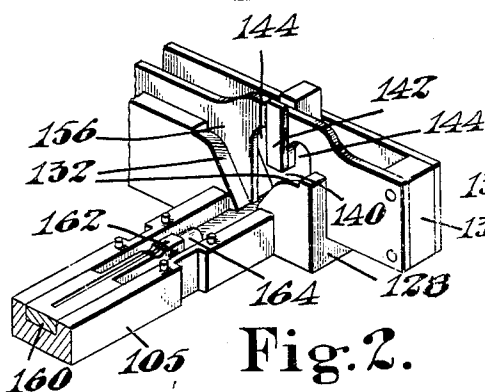
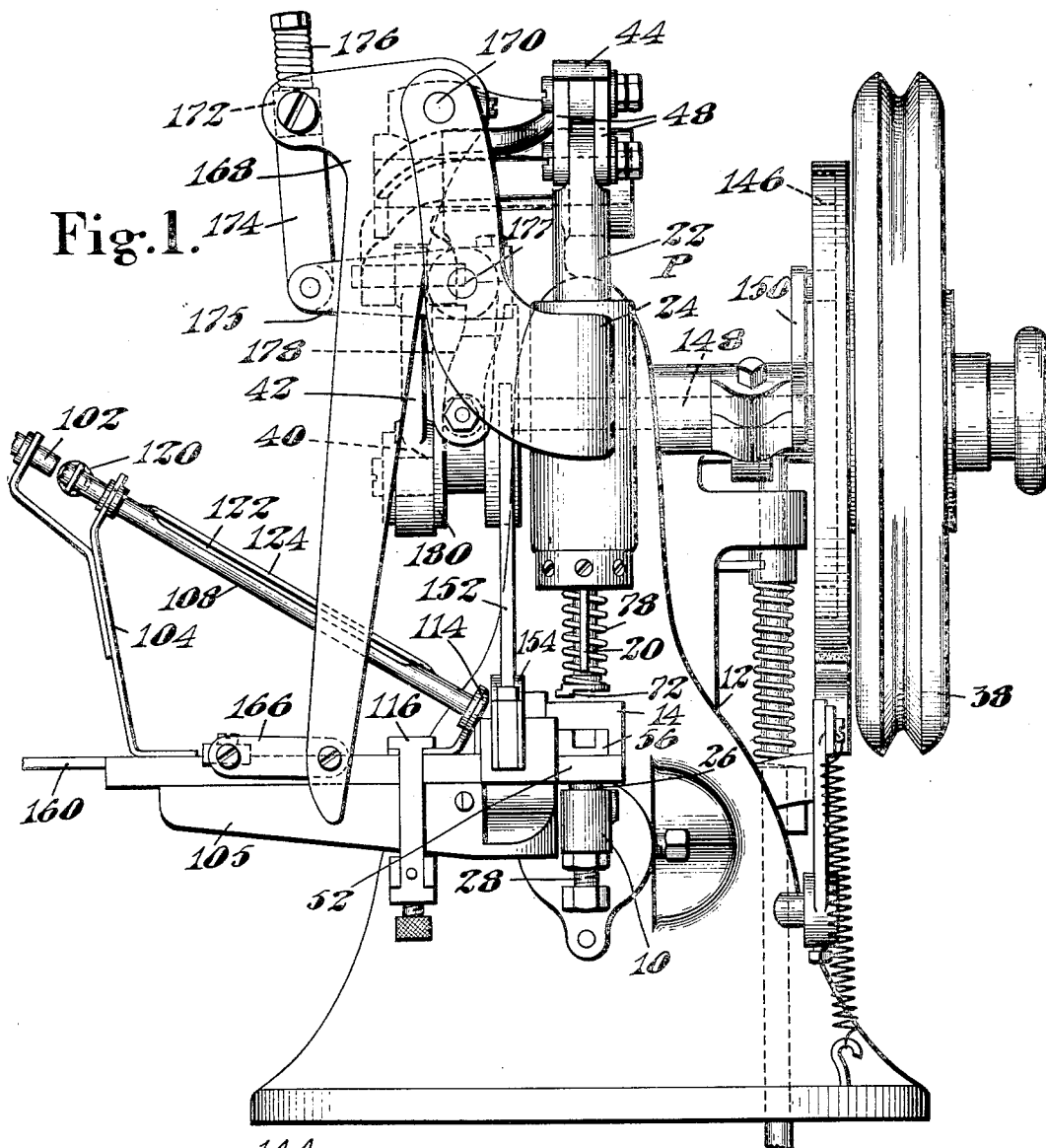
M. E. FERNALD

1,930,591

PUNCHING APPARATUS

Filed May 22, 1929

3 Sheets-Sheet 1



INVENTOR_

136 Mark E. Fernald
By his Attorney,
Nelson W. Howard

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M. E. FERNALD

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3 Sheets-Sheet 2

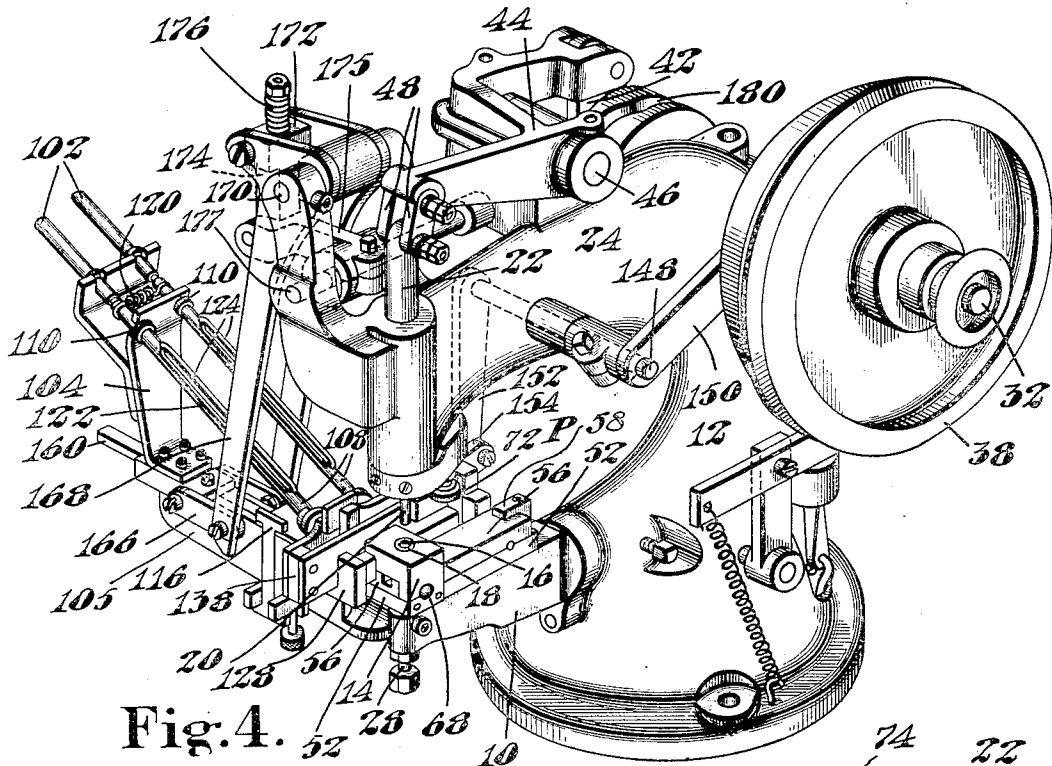


Fig. 4.

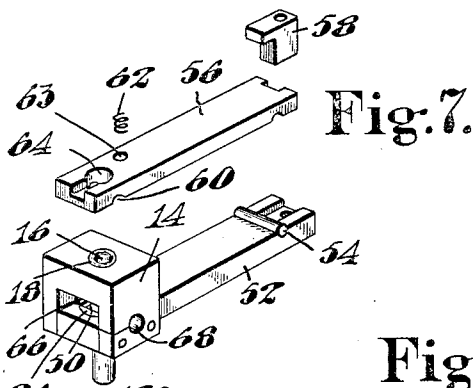


Fig. 7.

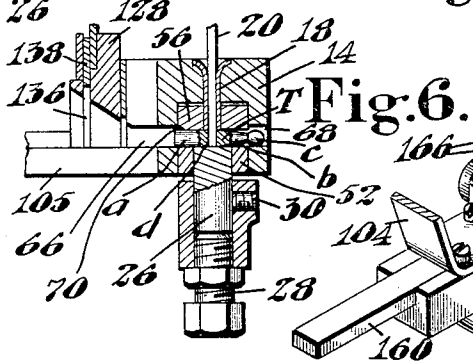


Fig. 6.

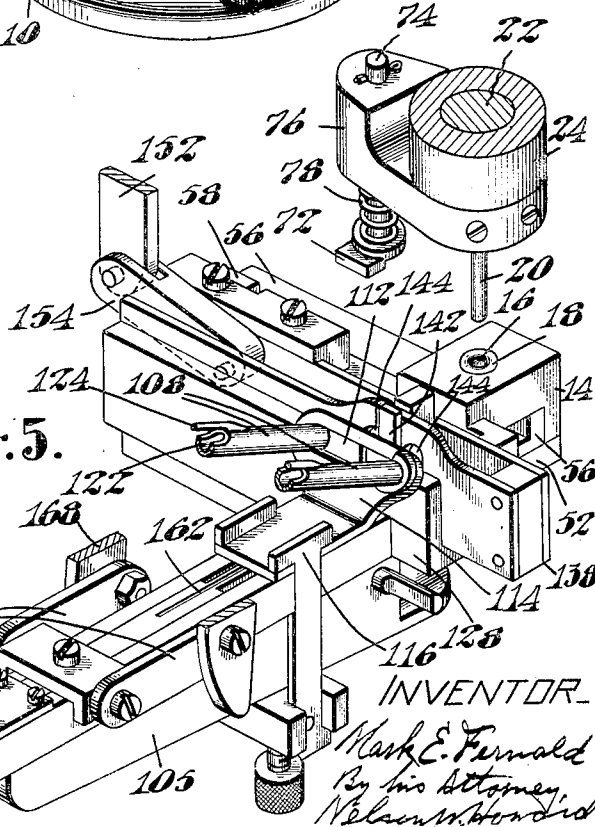


Fig. 5.

INVENTOR.

Mark E. Fernald
By his Attorney,
Nelson M. Bond

Oct. 17, 1933.

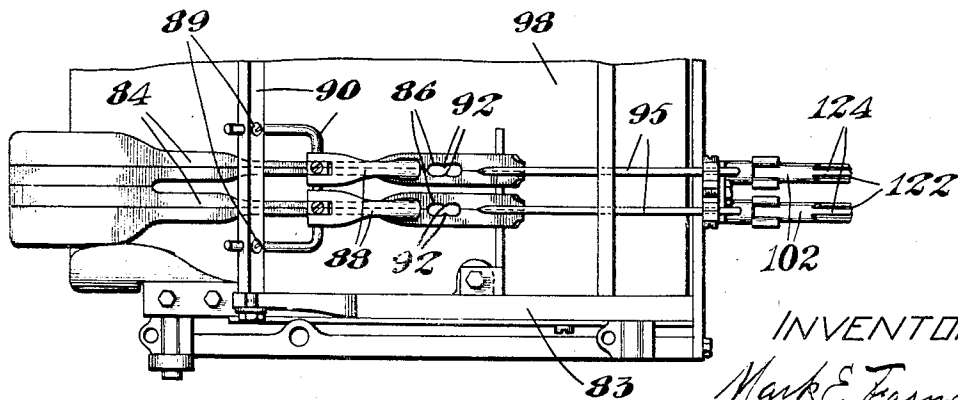
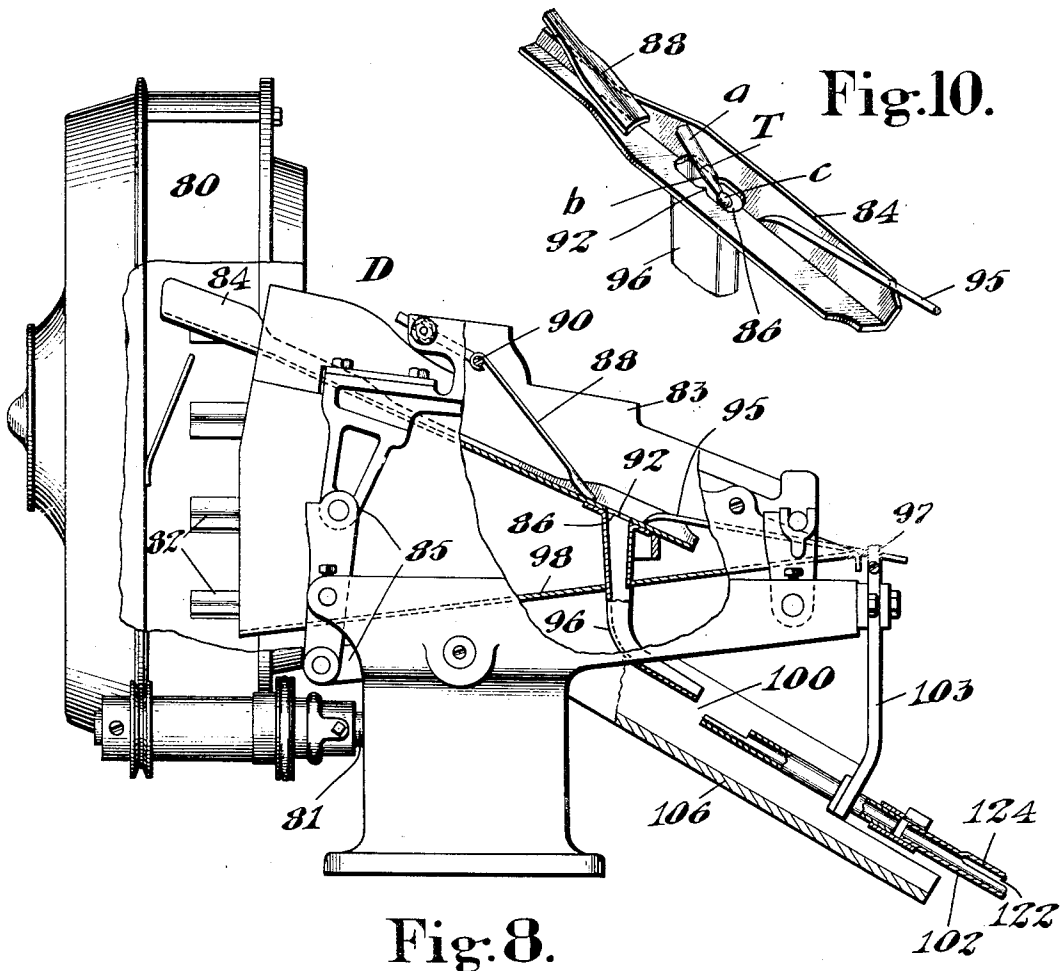
M. E. FERNALD

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PUNCHING APPARATUS

Filed May 22, 1929

3 Sheets-Sheet 3



INVENTOR.

Mark E. Fernald
By his Attorney,
Nelson Howard

UNITED STATES PATENT OFFICE

1,930,591

PUNCHING APPARATUS

Mark E. Fernald, Beverly, Mass., assignor to
United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application May 22, 1929. Serial No. 365,041

29 Claims. (Cl. 164—88)

My invention relates to apparatus for performing such operations as the punching of openings in various articles. The embodiment of the apparatus herein illustrated is especially adapted
5 for thus operating upon the tips of umbrella-ribs.

In the manufacture of umbrellas, there are frequently applied to the free ends of the ribs ornamental tips commonly formed from a moldable material. To these tips, the fabric of the cover
10 is sewed, a hole being made near the outer end of the body-portion of each tip to receive the attaching thread. It has been customary to drill these holes, the handling of the tips for this purpose substantially increasing the manufacturing
15 cost. An object of my invention is to avoid such individual manipulation of the articles, and to provide for their accurate perforation in a definite relation to their extremities. This object I attain by an apparatus in which there is combined with such an operating mechanism as a
20 die-block and a reciprocatory punch by which the desired openings are produced, a receptacle, as a rotatable drum, to receive a mass of the articles, together with means for conducting the articles
25 one by one from the receptacle to the punching mechanism, and for determining the end of each article which shall be advanced foremost for punching. The openings may be very efficiently produced in this way, the action of the punch
30 being rapid, the location of the openings accurately determined with respect to one or the other of the ends of the tips, and the delivery of said tips being entirely automatic. On account of the speed of operation of the punch, a single
35 conducting path between the receptacle and perforating mechanism may not deliver the articles as rapidly as they can be operated upon. I therefore advance the articles in a plurality of series, in the present instance two, and deliver successively from different series. This may be accomplished by two conduits which are a part of
40 a raceway system, a feeding member which supplies the punching mechanism, and a member acting as a valve and alternately delivering articles from the conduits to the feeding member.
45 In this way, while a tip from one conduit is being fed forward for punching, another may be received from the associated conduit and presented to the action of the feeding member as soon as said feeding member has returned to its
50 normal position and while the punch is acting. To avoid injury to the apparatus by clogging at the delivering or valve member, the portions of the conduits adjacent thereto may be yieldable,
55 so they may share in the movement of the mem-

ber. Associated with the operating mechanism is shown a novel arrangement of a yieldable clamp, into which the feeding member thrusts the work to be held in correct relation for the operation upon it. There is also preferably included means for pressing the clamp upon the
60 received article, this, as illustrated, consisting of a pressure member reciprocating with the punch.

One of the many forms which this invention may assume is illustrated in the accompanying
65 drawings. In these,

Fig. 1 is a front elevation of the punching apparatus and a portion of the tip-supplying means, other parts being omitted;

Fig. 2 is a perspective view of the tip-delivering
70 and feeding mechanism;

Fig. 3 is a similar view of the block or abutment portion of said mechanism.

Fig. 4 shows the apparatus of Fig. 1 in perspective and being taken from the right;

Fig. 5 is an enlarged perspective of the delivering, feeding and punching mechanisms;

Fig. 6 is a vertical section through the elements of the punching and clamping mechanisms more closely co-operating with the work;

Fig. 7 shows portions of the work-clamping device in separated perspective;

Fig. 8 is a broken side elevation of the tip-supplying portion of the apparatus omitted from Fig. 1;

Fig. 9 is an enlarged top plan view of the portion of the raceway device containing the reversing opening; and

Fig. 10 shows this portion of one of the raceways in perspective.

Upon a supporting arm 10 of a main frame 12 of punching apparatus P is mounted a die-block 14, the vertical opening 16 of which is preferably provided with a bushing 18 having at its upper extremity a flaring throat and receiving a reciprocating punch 20. This punch is carried in the lower end of a vertically movable plunger 22 guided in a bore through an arm 24 of the frame overhanging the die-block. It cuts against the horizontal upper face of an anvil 26 adjustable
100 vertically in the arm by a screw 28 and locked in place by a screw 30. The reciprocation of the punch is shown as effected under the power of a driving shaft 32 journaled in the upper portion of the frame at the rear and rotated by a pulley
105 38. The shaft, at its end opposite the pulley, has a crank-pin 40 joined by a link 42 to a bell-crank lever 44 fulcrumed at 46 upon the top of the arm 24. A double link 48 connects the bell-crank to the plunger 22. Thus, for each turn of
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the shaft 32, the punch 20 is reciprocated through the die-opening 16 to make a perforation in the work resting upon the anvil 26. This work is represented in Fig. 6 of the drawings as consisting of the tip T of an umbrella-rib. The tips, which are commonly of celluloid or similar material, may each possess an approximately cylindrical body *a* of substantial length, joined by an inclined portion *b* to a globular end or head *c*. At the juncture of the body and head is a point of minimum diameter. To hold the work for the punching operation, it preferably rests in a groove 50 (Fig. 7) beneath the die-block and formed in a fixed jaw 52 and the co-operating end of the anvil. Pivoted at 54 upon the fixed jaw is a movable jaw 56 retained in place by an overhanging angle-block 58. The jaw 56 has a groove 60 registering with the groove 50, and is forced toward the companion jaw by a spring 62 seated in a depression 63 in the jaw 56 and contacting at its upper extremity with the under side of the die-block. With the ends of the grooves are aligned openings 66 and 68 in the vertical supporting walls of the die-block, the first of these openings admitting the work-pieces, and the second discharging them after the punching operation. The entrance edge of the groove 60 is chamfered at 70 (Fig. 6), allowing the tips, when forced against this inclined surface, to raise the jaw 56 for their admission. Just before the engagement of the punch with the work, a pressure member 72 is yieldably forced against the upper side of the jaw 56. This member is shown as in the form of a foot fixed upon the lower extremity of a spindle 74 arranged to slide vertically in a bracket 76 projecting from the plunger 22 below its guiding arm. A spring 78, situated between the plunger and the upper surface of the foot, allows the latter to yield when it is pressed against the jaw 56, above which it moves. The foot normally lies at a point below the punch, so, when the plunger 22 descends, the foot bears upon the jaw 56 before the punch reaches the tip which is between the jaws, yielding as said punch makes its cutting stroke. This retains the work firmly against displacement during the operation upon it, the force exerted by the spring 62 being sufficient to effect retaining engagement of the jaws prior to the punching action.

Means is provided for automatically delivering the tips or other work-pieces, one by one from a mass in a receptacle, to the jaws to receive the action of the punch. In the present instance, the receptacle is included in a distributing apparatus D (Fig. 8), being in the form of a drum 80 rotatable about a horizontal axis from a shaft 81 and having buckets 82 by which the tips are lifted from the bottom of the drum and dropped upon the upper extremity of an inclined conducting or raceway device including an oscillatory frame 83 actuated by connections 85. It is found that the punching mechanism may be operated at a more rapid rate than a single raceway or conducting channel upon the frame 83 can supply. Consequently, I have arranged to deliver alternately to the punching mechanism from two raceways 84, 84. These raceways, with the connections to the punching mechanism, together with the delivering and feeding mechanism which controls the discharge of the tips and their presentation to said punching mechanism, will now be described.

Each raceway 84 is of V or trough-shape, considered transversely, and conducts the tips dropped upon it by the buckets of the drum in

series, end to end. Obviously, the tips may fall with either the globular head *c* or the body *a* in advance. To give the desired location of the punched opening in the work, the former relation has been chosen; and, to cause only the tips which are head-first to be delivered, a reversing device is included in each raceway. This device consists of an opening 86 (Figs. 9 and 10) through the bottom of its raceway, near the lower extremity, and a light pivoted finger 88 supported upon a bar 90 extending across the frame 83. Each finger has its forward end concave at its under side to generally correspond to the lateral contour of the tips and lying in proximity to the upper edge of the corresponding opening 86. Set-screws 89, threaded through the bar 90 and engaging the pivotal mounting of the fingers 88, permit these to be varied in their relation to the upper edges of the associated openings. Each of these openings has two lobes, separated by a contracted portion furnished by opposite inwardly extending points 92, 92 from the raceway. The space between the points is of sufficient width to pass the inclined portion *b* of the particular tip illustrated in Fig. 6 of the drawings up to a point near the body *a*, but will not admit either said body or the head *c*. As the tips flow down each raceway, those which are headfirst will leave the finger 88, while the tip-portion *b*, which is capable of passing at 92, is still over this contracted space (Fig. 10). At this time, the weight of the tip is so distributed that it will overbalance upon the rear edge of the raceway-opening and fall into a downwardly and forwardly extending chute 96 depending from the under side of each raceway. If the body *a* of the tip is foremost, the finger 88 will hold it against tilting until said body has bridged the gap between the points 92 and the forward end of the opening, so it cannot fall through said opening body-end-first. When that portion of the tapering part *b* which will enter between the points 92 has reached them, the weight of the tip will cause it to tilt back upon the forward edge of the opening and descend, head-first, upon the chute 96. To make more certain the reversal, through the opening 86, of the tips delivered to it body-first, there is shown extending over and close to the V-bottom of each raceway 84 from the fixed portion of the distributor-frame a pushing finger 95 clamped for longitudinal adjustment at 97. If a tip fail to be reversed in the manner just described, it will, in the oscillation of the raceway, be forced back by contact with the finger 95 and compelled to enter the opening head-first. If, by any chance, a tip rides over the finger 95, it will travel on down the raceway and fall upon a return-chute 98, leading rearwardly into the lower portion of the drum 80, to be again elevated thereby to the raceways.

The correctly positioned tips are discharged from the chutes 96 and pass, by virtue of their momentum, across a gap at 100, and enter the ends of aligned tubes or conduits 102 supported at their upper extremities upon a bracket 103 depending from the fixed frame of the distributor, and at their lower ends upon a bracket 104 (Figs. 1 and 4) carried by an extension 105 from the frame-arm 10 of the punching apparatus P. If the tips accumulate in the conduits 102 more rapidly than they are utilized by the punching apparatus, they will gradually fill the conduits until no more can enter from the chutes 96. The tips discharged from the distributor then fall upon a chute 106, to be directed to a receptacle, 155

in which they may be returned to the drum 80 at the convenience of the operator. To prevent injury to the feeding mechanism of the punching mechanism by clogging, which might occur, as will later more clearly appear, each conduit 102 is preferably provided with a yieldable terminal-section 108. The two sections rest at their upper ends in opposite slots 110 in the sides of a portion of the bracket 104, while their lower ends are movable along a slot 112 (Fig. 5) in a bracket 114 clamped at 116 to the extension 105 of the punching-mechanism frame. A tension-spring 120, connecting the upper ends of the sections 108, draws them both against the extremities of the slots 110 and oppositely against the ends of the slot 112. Either section is left free to move inwardly at its lower extremity toward its companion against the resistance of the spring, when they are subjected to the stresses set up by tips which clog while they are being fed. Both the main conduits 102 and their sections 108 have longitudinal slots 122 in their upper sides, which are closed, to prevent the escape of the work, by rods 124 of relatively small diameter secured at the ends of the slots. Openings of considerable extent are thus produced to allow inspection of the interior of the conduits, so the points at which clogging occurs may be located and the obstruction freed, and enable the operator to remove from the conduits, by inversion, chips and other dirt. In spite of this, the closure is such that the tips cannot ride over one another or be displaced in any other way in the operation of the apparatus or in the handling of the conduits.

Upon leaving the discharge-openings of the sections 108, each pair of tips comes under the influence of a delivery-controlling and feeding mechanism, which alternately releases the tips from the conduits and advances them into the clamping device to receive the action of the punching mechanism. Each section 100 terminates opposite a vertical shoulder 126 (Fig. 3) at one side of a channel through a block 128 supported upon the arm-extension 105. From side walls 130 to the rear of each of the shoulders, the block curves down and in at 132, 132 to the bottom of the channel, which furnishes a space at 134 sufficiently wide to receive one tip. Upon the upper portion of each curved wall a tip may rest, retained against forward travel by the corresponding shoulder 126. Through the block, transversely of the conduits and channel 134, are spaced vertical slots 136, 136, in which is movable a slide or valve member 138 (Fig. 2), shown as made up of connected plates. Through the slide, co-operating with the channel-space 134 and with the walls 132, 132, is an opening 140 rising to at least the tops of the discharge-openings of the conduits, and partially divided by a depending wall 142 at its center. At each side of the wall 142 is a portion 144 of the opening 140. These openings 144, 144 may be respectively aligned with the conduits 103, and will then permit a tip therein to move against and be temporarily retained against advance by the corresponding shoulder 126 while resting upon the top of the wall 132. As appears in Fig. 2, one opening portion 144 is positioned to receive a tip from the right-hand conduit 108, while the contents of the companion conduit are held back by the wall 156 of the slide. Reciprocation is imparted to the slide from a cam 146 upon the shaft 32 through a shaft 148 turning in the frame-arm 24 and having an arm 150 engaging the cam and an opposite arm 152

joined by a link 154 to the slide. The movement of the slide in each direction occurs once for each operation of the punch 20, and its extent is such that, for one extreme, the relation just referred to as illustrated in Fig. 2 is set up, while at the opposite extreme a tip is allowed to pass from the left-hand conduit, while the flow from that at the right is cut off. Upon each movement of the slide, a previously discharged tip is caused to roll down one of the walls 132 into the channel 134. Here, it is ready to be fed into punching position between the jaws 52 and 56. If, in this delivering movement of the slide, a tip happens to be caught with its end projecting from one of the conduits instead of advancing fully into the abutment-space against a shoulder 126, the contact of the edge of the opening 140 in the slide with this clogged tip will not injure the mechanism, since the conduit in which the projecting tip is held will yield against the spring 120. Under some conditions, this tip may remain thus retained until it is cleared manually, or it may free itself, so the discharge will be resumed. In the former instance, the clogged conduit will continue to oscillate idly under the influence of the slide.

Arranged to slide horizontally in the arm-extension 105, in alignment with the channel-space 134, is a feed-bar 160. The inner portion of this bar appears in Figs. 2 and 5 of the drawings as divided, the parts being drawn together by a screw 162 to clamp a feeding pin 164. This pin may or may not be adapted to enter the longitudinal bore which umbrella-tips of this character ordinarily contain. If the drilling of this bore is likely to be irregular, it may be desired to feed the tips by contact of the pin with the bottom of said bore. This insures against the punch penetrating the bore. In this case, the diameter of the pin will be relatively small. If feeding by contact with the outer end of the body a is satisfactory, the diameter of the pin may be substantially that of the tip. The bar is connected by a pair of links 166 to a double bell-crank lever 168 fulcrumed at 170 upon the frame-arm 24. Pivoted upon the lever is a block 172 carrying a link 174 yieldable downwardly against a spring 176. The lower extremity of the link 174 is articulated to an arm 175 upon a shaft 177 turning horizontally upon the arm 24 and having secured to it an arm 178 actuated by a cam 180 fast upon the shaft 32. The reciprocation of the feeding bar is so timed that it occurs as each tip is delivered into the channel 134. The pin 164, contacting either with the end of the tip-body or the bottom of the bore therein, forces the engaged tip through and out of the channel, its head engaging the chamfered throat 70 of the jaw 56, which it raises against the spring 62. The feeding device retreating, the tip is left correctly positioned in the groove 50, 60 of the jaws beneath the die-opening 16. The plunger 22 now descends, the foot 72 first yieldably pressing down the jaw 56 to more positively clamp the tip against displacement, this being followed by the passage of the punch through the work, forming an opening d (Fig. 6).

The operation of the entire organization may be outlined as follows: The tips T or other objects to be operated on are placed in the drum 80, being elevated by the buckets 82 and dropped upon the two raceways 84. Reaching the reversing openings 86, those which are head-foremost pass directly through said openings, while those which have the bodies a in advance cross the

openings and tilt back, heads down, aided by the pushing fingers 95 which lie in their line of travel. Practically all, thus correctly positioned, descend the chutes 96, leap the spaces 100, provided the alined conduits 102 are not full, and flow down these conduits in a continuous series. In the end section 108 of one conduit, the series of tips will be stopped by contact of the terminal tip with the slide-wall at 156. The terminal tip in the associated conduit passes on through a portion 144 of the slide-opening, and, upon the succeeding movement of the slide, is caused to fall laterally into the channel 134 of the block 128, while delivery is at the same time being made from the conduit in which the tips were previously held back. Thus, tips are discharged in rapid succession alternately from the two raceways and their alined conduits, under the control of the slide. For each delivery thus made, the feeding pin 164 acts to forward the delivered tip longitudinally beneath the clamping jaw 56, which it raises against the spring 62. Here it is more firmly clamped by the foot 72 upon the descending plunger 22, and is perforated by the punch 20. For the next cycle of the punching mechanism, a tip from the other raceway is similarly presented and acted upon. Each tip fed forces out from beneath the jaw 56 the punched tip, which may be received in a container. At this time, the jaw is released from the pressure member 72, and is only held down by its spring 62.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. The combination with punching mechanism, of a receptacle arranged to receive in a mass articles to be punched, means for conducting the articles from the receptacle one by one to the punching mechanism, and means for determining the end of each article which shall be advanced foremost to the punching mechanism.

2. The combination with punching mechanism, of a receptacle arranged to receive in a mass articles to be punched, means for advancing simultaneously a plurality of series of articles from the receptacle toward the punching mechanism, and means for delivering successively to the punching mechanism terminal articles of different series.

3. The combination with punching mechanism, of a receptacle arranged to receive in a mass articles to be punched, means for advancing simultaneously a plurality of series of articles from the receptacle toward the punching mechanism, means for delivering successively to the punching mechanism terminal articles of different series, and means for limiting the thus delivered articles to those having a particular end foremost.

4. The combination with punching mechanism, of a movable article-feeding member co-operating therewith, means for advancing a plurality of series of articles, and means for delivering to the feeding member successively from different series of articles.

5. The combination with punching mechanism, of a movable article-feeding member co-operating therewith, means for advancing a plurality of series of articles, means for delivering to the feeding member successively from different series of articles, and an article-reversing device associated with the advancing means of each series.

6. The combination with punching mechanism, of a receptacle for articles to be punched, two conduits receiving articles from the receptacle, a member receiving articles from the conduits and being movable to feed them to the punching mechanism, and means for alternately delivering articles from the conduits to the feeding member.

7. The combination with punching mechanism, of a receptacle for articles to be punched, two conduits receiving articles from the receptacle, a member receiving articles from the conduits and being movable to feed them to the punching mechanism, and means for alternately delivering articles from the conduits to the feeding member, portions of the conduits adjacent to the delivering means being yieldable.

8. The combination with operating mechanism, of a receptacle for articles to be operated upon, two conduits receiving articles from the receptacle, the conduits having end sections movable independently of the bodies of said conduits, a spring against the action of which the end sections may yield, and a delivering member for the operating mechanism co-operating with the conduits and movable in the direction of their yield.

9. The combination with operating mechanism and a receptacle for articles to be operated upon, of a conduit receiving articles from the receptacle and having a movable end section, members provided with slots in which the end section rests, a spring arranged to draw the end section against the extremities of the slots, and a delivering member for the operating mechanism movable in co-operation with the end section.

10. The combination with punching mechanism, of a receptacle for articles to be punched, an oscillatory raceway receiving articles from the receptacle, a chute depending from the raceway, and a conduit receiving articles from the chute but spaced therefrom and delivering said articles at the punching mechanism.

11. The combination with operating mechanism and a receptacle for articles to be operated upon, of an inclined raceway provided with an opening over which the articles travel from the receptacle to the operating mechanism, the size of the opening being sufficient to permit passage of the articles through it, and a member situated above the raceway in proximity to the upper end of the opening and arranged for contact with articles which are over the opening.

12. The combination with operating mechanism and a receptacle for articles to be operated upon, of a raceway provided with an opening having a portion contracted transversely of the raceway and through which certain articles travel directly from the receptacle to the operating mechanism, said opening being arranged to reverse the travel of other articles.

13. The combination with operating mechanism and a receptacle for articles to be operated upon, of an inclined raceway provided with an opening having a portion contracted transversely of the raceway and through which the articles travel from the receptacle to the operating mechanism, and a retaining member extending above the raceway to a point adjacent to the upper end of the opening and contacting with articles which are over said opening.

14. The combination with operating mechanism and a receptacle for articles to be operated upon, of a raceway provided with an opening

having a portion contracted transversely of the raceway and through which the articles travel from the receptacle to the operating mechanism, and a pushing member acting upon the articles at the lower end of the opening.

15. The combination with operating mechanism and a receptacle for articles to be operated upon, of an inclined raceway provided with an opening having a portion contracted transversely of the raceway and through which the articles travel from the receptacle to the operating mechanism, a finger extending in proximity to the upper end of the opening and contacting with articles which are over said opening, and a finger extending along the raceway below the opening and in the line of travel of the articles.

16. The combination with operating mechanism and a receptacle for articles to be operated upon, of conduits through which articles are advanced from the receptacle for the operation upon them, a member having a channel situated between the conduits and leading to the operating mechanism, and a movable member controlling the flow of articles from the conduits to the channel.

17. The combination with operating mechanism and a receptacle for articles to be operated upon, of conduits through which articles are advanced from the receptacle for the operation upon them, a member having a channel situated between the conduits and leading to the operating mechanism, a movable member controlling the flow of articles from the conduits to the channel, and a feeding member movable in the channel.

18. The combination with operating mechanism and a receptacle for articles to be operated upon, of two conduits through which articles are advanced from the receptacle for the operation upon them, a member having a retaining wall aligned with each conduit and a channel situated between said walls and leading to the operating mechanism, and a movable valve member having a divided opening each portion of which is alternately aligned with one of the retaining walls and with the channel.

19. The combination with operating mechanism and a receptacle for articles to be operated upon, of two conduits through which articles are advanced from the receptacle for the operation upon them, a member having a retaining wall aligned with each conduit and a channel situated between said walls and leading to the operating mechanism, a movable valve member having a divided opening each portion of which is alternately aligned with one of the retaining walls and with the channel, and a feeding member movable through the channel and through the opening in the valve member.

20. The combination with a die-block, of a clamping member fixed below the die-block, an upper clamping member situated above the companion member and pivoted for movement toward and from it, a spring arranged to force the upper member toward the lower, a reciprocatory punch co-operating with the die-block, and a pressure member movable with the punch and engaging the upper clamping member.

21. The combination with a die-block, of a clamping member fixed below the die-block, an upper clamping member situated above the companion member and pivoted for movement toward and from it, a spring arranged to force the upper member toward the lower, a reciprocatory punch co-operating with the die-block, a pressure mem-

ber movable with the punch and engaging the upper clamping member, and a reciprocatory feeding member arranged to thrust articles to be punched between the clamping members.

22. In an apparatus for punching umbrella-tips, a rotatable drum for holding a supply of tips, punching mechanism comprising a die-block and a reciprocatory punch, and a plurality of conduits arranged to conduct the tips from the drum to the punching mechanism.

23. In an apparatus for punching umbrella-tips, said tips having a body-portion, a head and an intermediate reduced portion, punching mechanism, a rotatable drum for holding a supply of tips, and a raceway receiving tips from the drum and advancing them toward the punching mechanism, the raceway being provided with means arranged to pass the tips with the heads in a definite direction.

24. In an apparatus for punching umbrella-tips, said tips having a body-portion, a head and an intermediate reduced portion, punching mechanism, a rotatable drum for holding a supply of tips, a raceway receiving tips from the drum and advancing them toward the punching mechanism, there being an opening in the raceway with a contracted portion of less width than the bodies and heads of the tips and wider than the reduced portions, and a finger contacting with the tips in the raceway above the opening and arranged to retain those which are body-foremost until they have bridged the space between the contracted portion and the forward extremity of the opening.

25. In an apparatus for punching umbrella-tips, said tips having a body-portion, a head and an intermediate reduced portion, punching mechanism, a rotatable drum for holding a supply of tips, a movable raceway receiving tips from the drum and advancing them toward the punching mechanism, there being an opening in the raceway with a contracted portion of less width than the bodies and heads of the tips and wider than the reduced portions, and a finger fixed relatively to the raceway and contacting with the tips in the raceway below the opening.

26. In an apparatus for punching umbrella-tips, a rotatable drum for holding a supply of tips, punching mechanism comprising a die-block and a reciprocatory punch, a plurality of conduits arranged to conduct the tips from the drum to the punching mechanism, a member movable laterally of the tips to deliver them successively from different conduits, and a feeding member arranged to advance the delivered tips longitudinally to the punching mechanism.

27. In an apparatus for punching umbrella-tips, a rotatable drum for holding a supply of tips, punching mechanism comprising a die-block and a reciprocatory punch, a plurality of conduits arranged to conduct the tips between the drum and punching mechanism, a member movable laterally of the tips to deliver them successively from different conduits, a feeding member arranged to advance the delivered tips longitudinally to the punching mechanism, and a yieldable clamp associated with the punching mechanism into which the feeding member forces the tips.

28. In an apparatus for punching umbrella-tips, a rotatable drum for holding a supply of tips, punching mechanism comprising a die-block and a reciprocatory punch, a plurality of conduits arranged to conduct the tips between the drum and punching mechanism, a member movable laterally of the tips to deliver them successively from different conduits, a feeding member arranged to

advance the delivered tips longitudinally to the punching mechanism, a yieldable clamp associated with the punching mechanism into which the feeding member forces the tips, and a pressure member reciprocating with the punch and contacting with the clamp.

29. The combination with a die-block and a co-operating reciprocatory punch movable above said

die-block, of a yieldable clamp arranged below the die-block, means movable with the punch and contacting with the clamp to operate it, a movable feeding member arranged to thrust work into the clamp, and means for effecting feeding movement of the member when the punch is raised.

MARK E. FERNALD.

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