

Feb. 23, 1943.

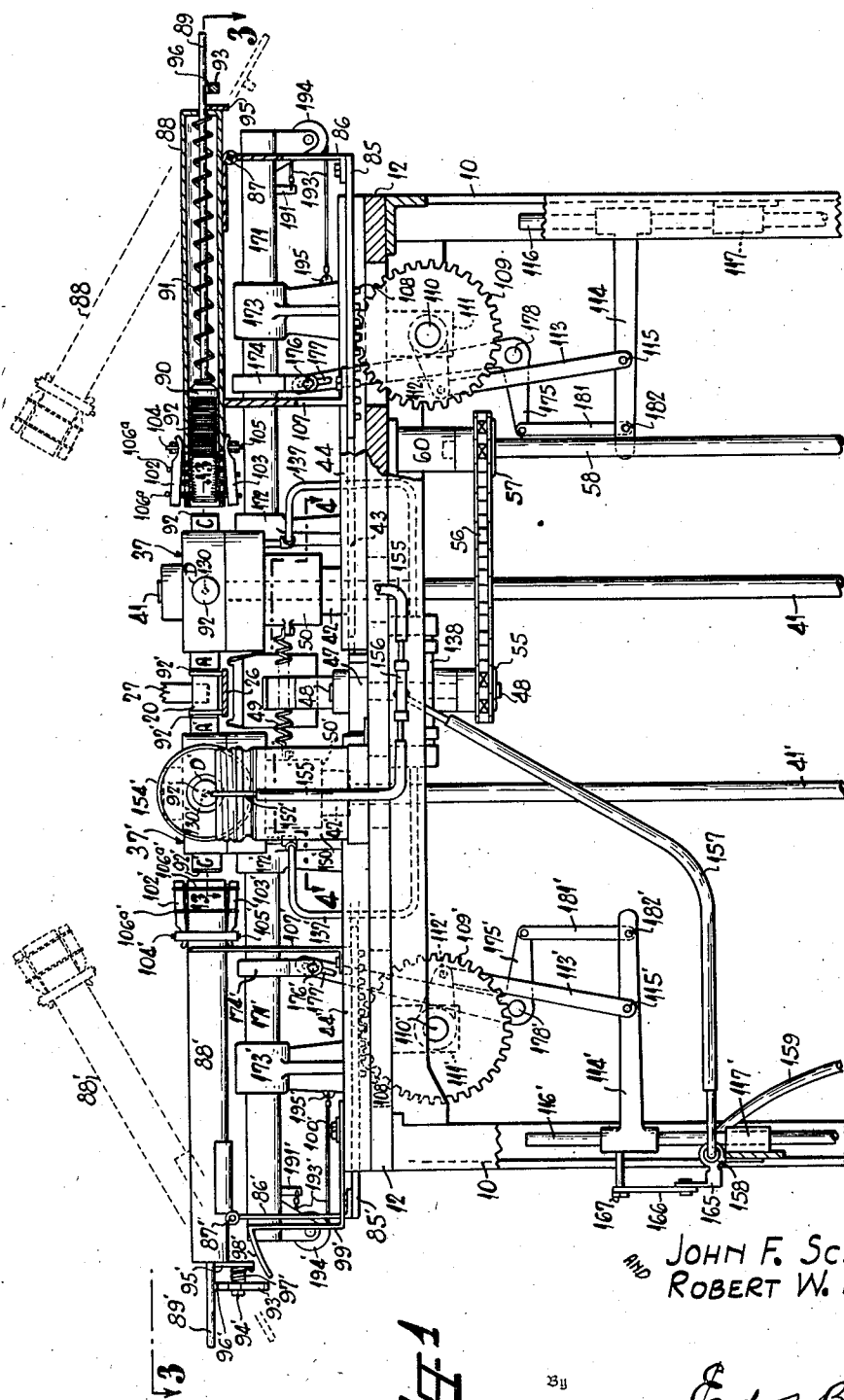
J. F. SCHENCK, JR., ET AL

2,311,969

PACKAGE LABELING MACHINE

Filed April 27, 1942

6 Sheets-Sheet 1



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Fig. 1

311

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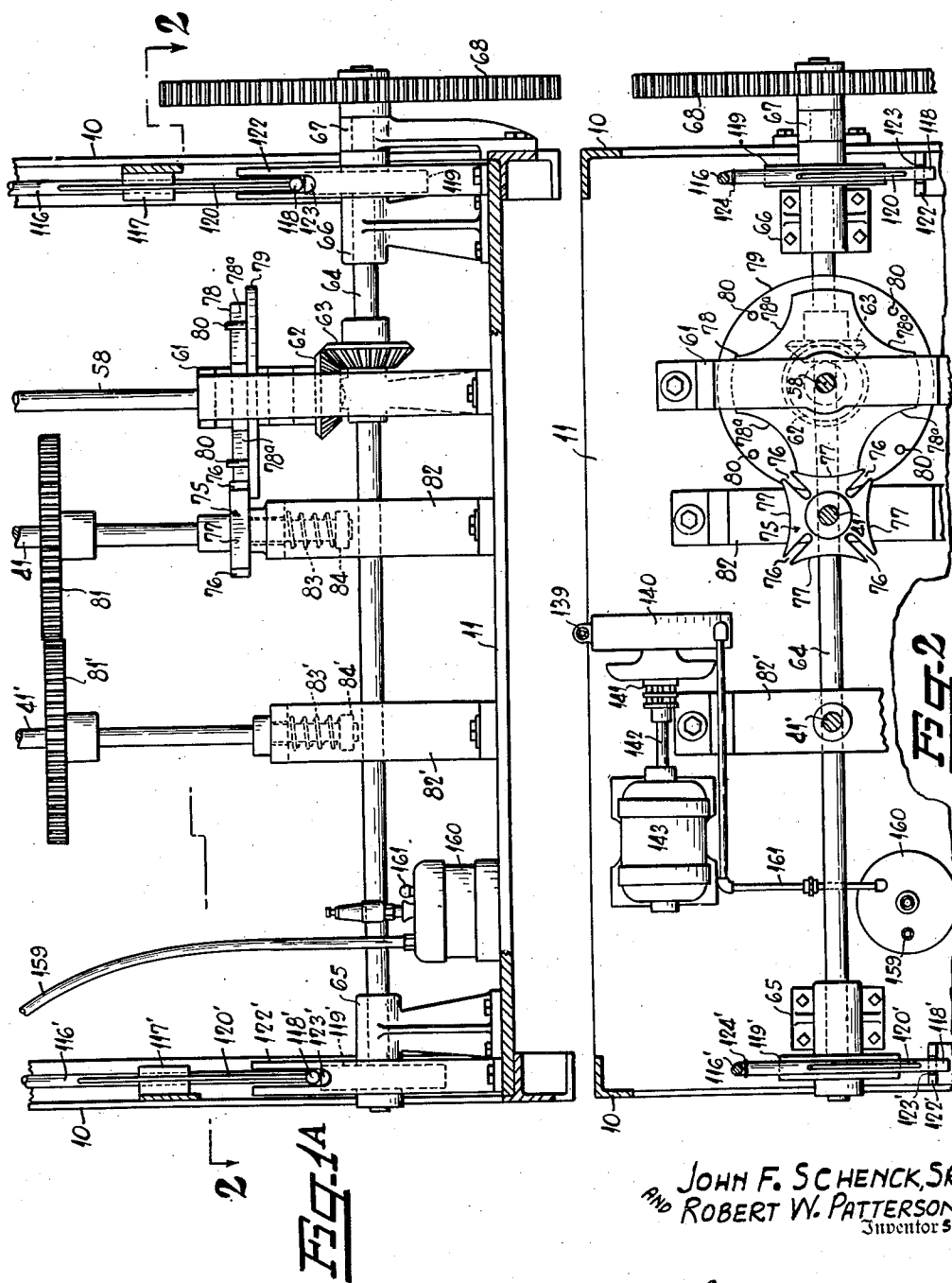
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6 Sheets-Sheet 2



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6 Sheets-Sheet 3

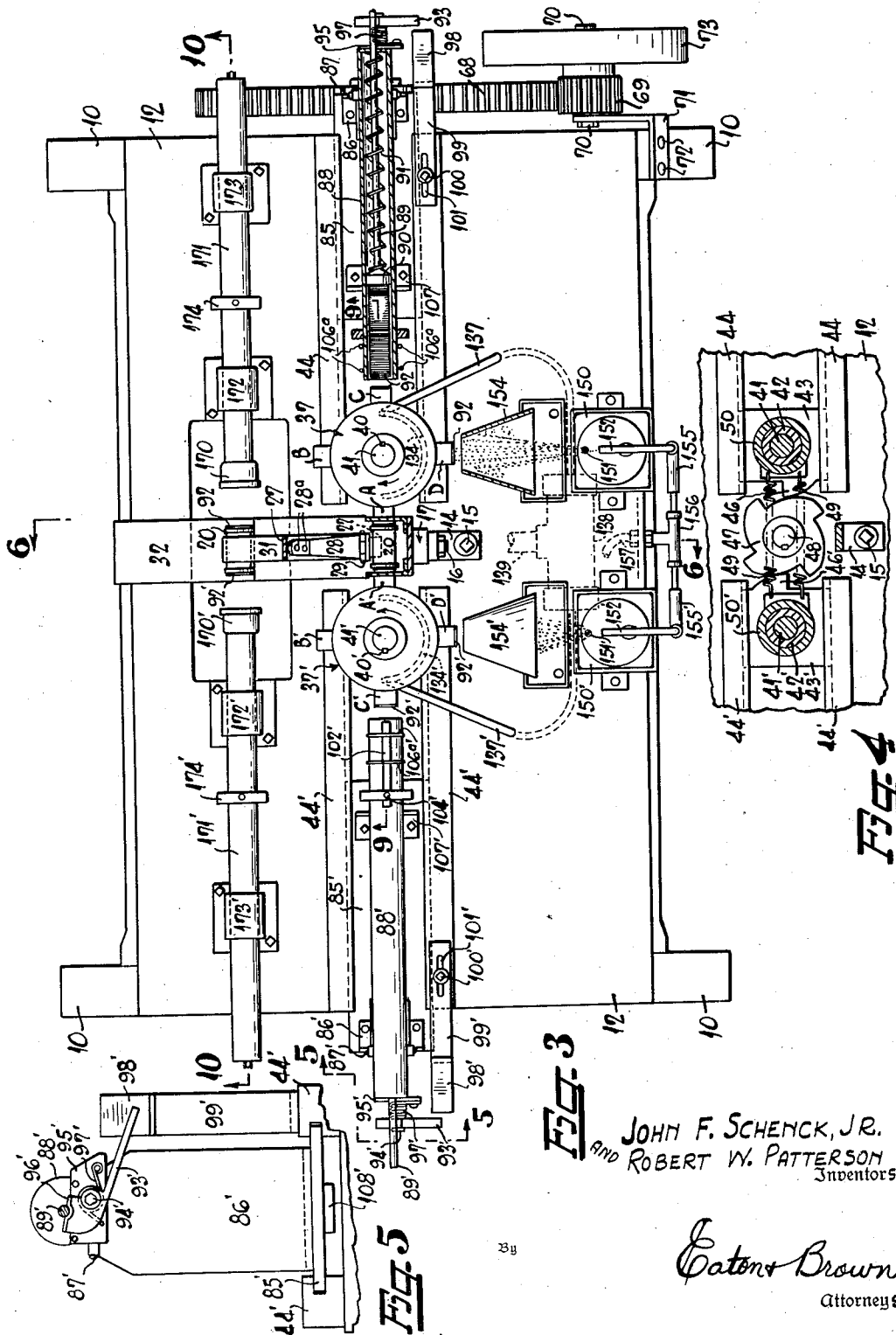


Fig. 3

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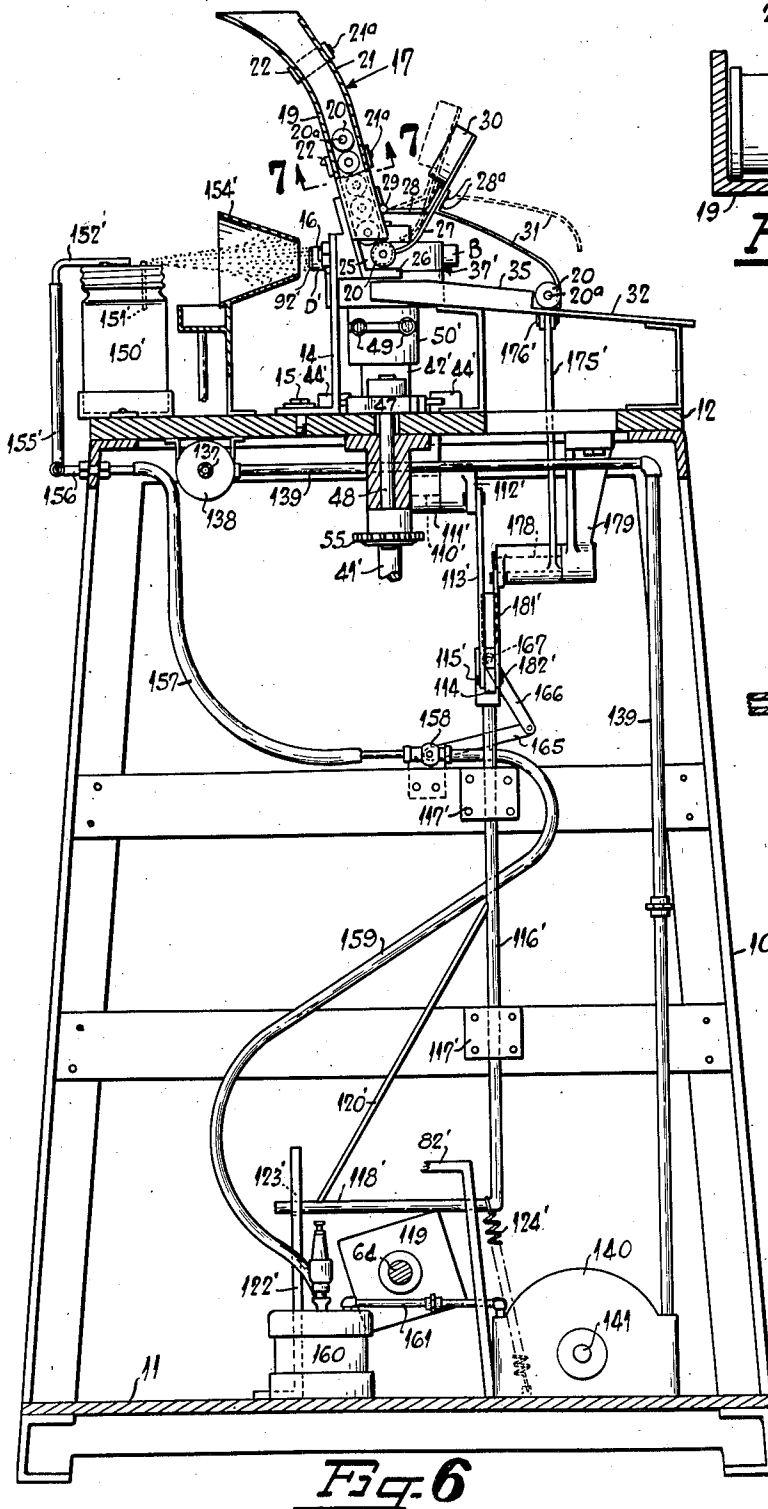
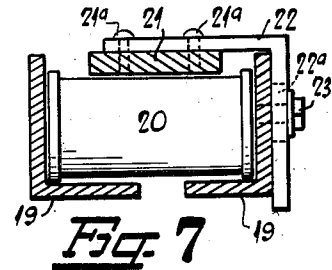
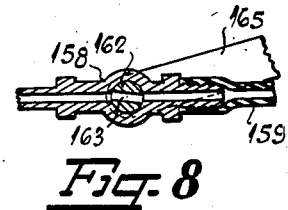
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PACKAGE LABELING MACHINE

Filed April 27, 1942

6 Sheets-Sheet 4



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2,311,969

PACKAGE LABELING MACHINE

Filed April 27, 1942

6 Sheets-Sheet 6

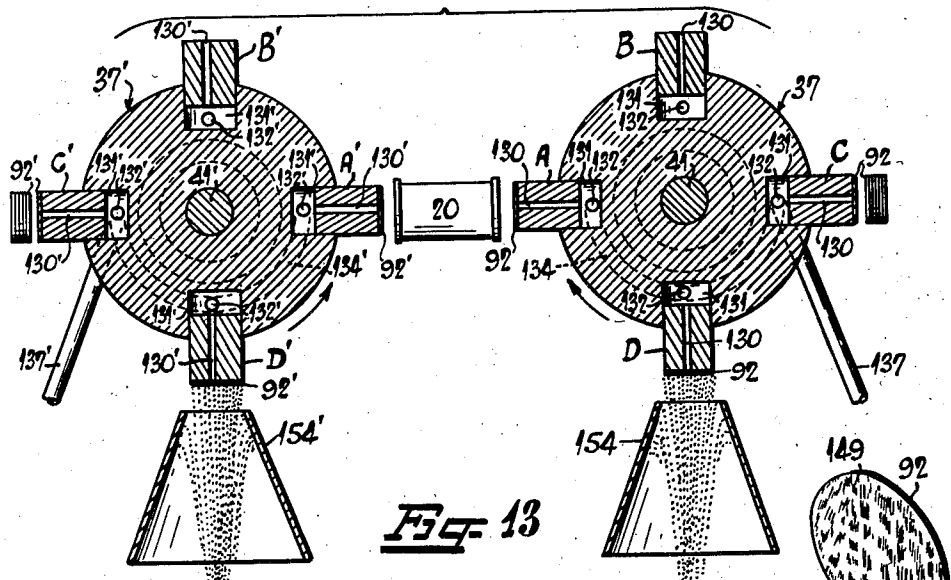


Fig. 13

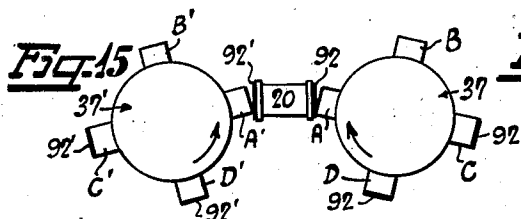


Fig. 15

Fig. 14

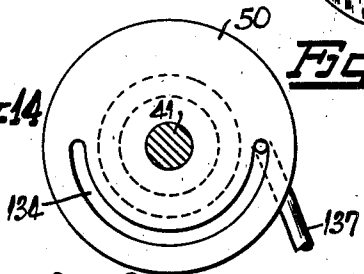


Fig. 16

ONE REVOLUTION OF DRIVE SHAFT 64

	1/4 Rev.		1/4 Rev.		1/4 Rev.		1/4 Rev.	
	Stationary	Rotating 90°	Stationary	Rotating 90°	Stationary	Rotating 90°	Stationary	Rotating 90°
NOZZLES A-A'								
NOZZLES B-B'								
NOZZLES C-C'								
NOZZLES D-D'								
Label Magazine Moving Inwardly								
Label Magazine Moving Outwardly								
Nozzles Engaging Spool Heads								
Nozzles Withdrawing from Spool								
Pressers Moving Inwardly								
Pressers Engaging Spool Heads								
Pressers Withdrawing								

Fig. 17

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2,311,969

PACKAGE LABELING MACHINE

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Application April 27, 1942, Serial No. 440,612

14 Claims. (Cl. 216-10)

This invention relates to a machine for applying labels to articles of merchandise and the like and more particularly to improvement in the structure shown in Patent No. 1,970,835 of September 25, 1934.

It is an object of this invention to provide a machine for applying labels to packages such as spools, in which an assembly of intermittently rotatable label carrying nozzles are employed, together with means for moving one of said nozzles and its associated label against the end of the spool while the nozzle assembly is not rotating.

It is another object of this invention to provide a machine having means for successively applying adhesive labels to packages, such as spools of thread, in combination with a mechanism for subsequently pressing the applied label more firmly in position, while another label is applied to the next succeeding package or spool.

It is a further object of this invention to provide a labeling machine comprising a plurality of nozzles, revoluble intermittently about a common axis, each of said nozzles being adapted to successively pass adjacent three elements, namely a label magazine, a spray head, and a package to be labeled. While one nozzle is receiving a label from the magazine, the label on the adjacent nozzle is being rendered adhesive by the spray head, and the adhesive label on a third nozzle is being applied to the package.

Some of the objects of the invention having been stated other objects will appear as the description proceeds when taken in connection with the accompanying drawings in which:

Figure 1 is an elevation of the upper portion of the labeling machine, omitting the package feed and showing other portions in section;

Figure 1A is a vertical sectional view showing the lower portion of the labeling machine, said view showing the lower portion of the machine, the upper half of which is shown in Figure 1;

Figure 2 is a sectional plan view taken along the line 2-2 in Figure 1A;

Figure 3 is a plan view showing certain portions thereof in section of the labeling machine, said view being taken along the line 3-3 in Figure 1;

Figure 4 is a sectional plan view taken along the line 4-4 in Figure 1 illustrating a spring and cam means for moving the nozzles and turrets toward and away from the package to be labeled;

Figure 5 is a sectional elevation taken along the line 5-5 in Figure 3 showing a detail of a brake for the label magazine;

Figure 6 is a vertical sectional view taken along the line 6-6 in Figure 3;

Figure 7 is a sectional detail view through the package chute, and taken along the line 7-7 in Figure 6;

Figure 8 is a sectional view through the valve which controls the compressed air flow to the atomizing equipment;

Figure 9 is an enlarged vertical sectional view taken along the line 9-9 in Figure 3 illustrating portions of the label magazines, label nozzles, label turrets, and package chute;

Figure 10 is a vertical sectional view taken along the line 10-10 in Figure 3;

Figure 11 is an enlarged sectional view similar to the central portion of Figure 10, showing the label presser mechanism in contacting position with the opposed ends of a labeled spool;

Figure 12 is a sectional view similar to Figure 11 but showing the action of the mechanism when a label is omitted from one end of the spool;

Figure 13 is a sectional plan view through the label turrets and nozzles, said view being taken along lines 13-13 in Figures 1 and 9;

Figure 14 is a sectional plan view taken along the line 14-14 in Figure 9;

Figure 15 is a schematic diagram illustrating the movement of the nozzles and associated spool, as the spool is being moved from label applying position;

Figure 16 is an isometric view of a label, showing a suitable adhesive applied to one face thereof;

Figure 17 is a timing diagram, showing the relative positions of certain parts of the labeling machine during one revolution of the main drive shaft.

Referring more particularly to the drawings the numeral 10 denotes suitable side frames of conventional make between which a lower bed plate 11 and an upper bed plate 12 are secured.

Package feed

The upper bed plate has an angle bracket 14 secured thereto by any suitable means such as a stud bolt 15, and the upper end of this bracket has secured thereto, as at 16, a package or spool chute 17 (Figures 3, 4 and 6). By observing Figure 7 the details of the spool chute 17 can be more clearly seen. It is here seen that the chute comprises a pair of angle iron members 19, so positioned relative to each other as to

form a trough between which suitable packages such as spools 20 are adapted to be positioned. A piece of strap iron, or the like, 21 serves to loosely confine the spools 20 within the chute one above the other. This member 21 may be adjusted so as to vary the effective depth of the chute by means of L-shaped bracket members 22, one leg of each bracket being secured to the strap member 21 as at 21a, and its other leg being adjustably secured to one of the members 19 by means of a stud bolt 23. Since the bolt 23 penetrates a slot 22a and has its inner end embedded in one leg of member 19, it is evident that the members 21 and 22 may be adjusted to accommodate spools of different diameters.

The lower portion of the chute 17 is cut-away as at 25 thereby exposing both ends of the lowermost spool 20. Slightly below these cut-away portions 25, a platform 26 is provided for supporting the lowermost spool in proper position. Also, as an additional means for holding the spool in the proper position on the platform 26, a bar 27 is provided, said bar having its lower end engaging the periphery of the spool and having its upper end attached to an arm 28 as at 28a which, in turn, is pivotally secured as at 29 to the spool chute 17. A suitable weight 30 is secured to the extreme upper end of the bar 27 so as to normally press the entire assembly downwardly.

It will be noted by observing Figure 6 that a third arm 31 is also secured to the strap member 27 as at 28a and the free end of this arm is adapted to rest on top of an inclined platform 32 during a labeling operation. The free end of arm 31 serves to hold a labeled spool in position for label detecting and pressing operations. When, however, the lowermost spool in chute 17 is released, the members 27, 28 and 31 are rotated to substantially a dotted line position to thereby release the two spools which are respectively held by arms 27 and 31. Attention is called to the function of the free end of arm 31. When this arm is in the bold line position shown in Figure 6 it serves to hold a labeled spool in position so that an additional pressing operation can be effected so as to more firmly press the label in position upon each end of the spool head. Also if a label has been omitted, or improperly applied, a feeler mechanism serves to segregate these spools when held by arm 31. The mechanism employed for applying the labels, pressing the labels, and removing the spool having no label thereon will be later described.

In the operation of the present machine an operator usually stacks the spools 20 within the chute 17 one upon the other. The lowermost spool 20 is disposed between suitable label applying means which intermittently and simultaneously apply a label to each end of the spool. When the label is applied this same label applying means serves to remove the labeled spool from lowermost position and thereby allow the next succeeding spool to fall into labeling position upon platform 26. As the labeled spool is removed, that is moved laterally to the right in Figure 6, the members 27, 28 and 31 are rotated upwardly about pivot point 29 to substantially dotted line position to permit the lowermost labeled spool to roll downwardly from platform 26 to a second platform 35 and then to the next succeeding platform 32 where it will be temporarily retained by arm 31 in the position shown in Figures 3 and 6.

Label applying mechanism

In the following description it should be borne in mind that the machine is substantially symmetrical about the center line. Since many of the parts on one side of the center line are either identical or opposite hand to the parts on the other side a description will be made only of the parts on one side of the machine. The identical or opposite hand parts will be given the same reference character, with prime notation added, without making a full description of these parts.

The label applying means, in part, comprises a pair of rotating turrets broadly designated by reference characters 37 and 37' (Figures 1, 4, 6, 9, 13 and 15). These turrets have nozzles ABCD and A'B'C'D' respectively. In the drawings the nozzles are spaced approximately at 90° apart and are rotatable in a substantially horizontal plane.

The turret 37 is fixedly secured as at 40 upon the upper end of a vertically disposed shaft 41. As a means for supporting the shaft 41 a suitable bracket 42 is provided, said bracket having a flanged base 43 which slidably fits between suitable grooved guideways 44. These guideways 44 are secured to the upper bed plate 12. Shaft 41 is not only rotatably mounted in the bracket 42, but the upper end thereof has a slight lateral movement in the direction of the guideways when labels are being applied. A slot 45 is cut in the bed plate 12 to permit this lateral movement, and a suitable star-shaped cam 47 is provided on the upper end of a rotating shaft 48 to cause the rotating shaft to move (Figures 4 and 9). The prongs of cam 47 are adapted to engage a projection 46 on base 43 of the bracket 42 and thereby cause the shaft 41 and the associated turret 37 to move toward and away from the adjacent spool head.

In the position shown in Figures 3, 4, and 9 the nozzles A and A' on the turrets 37 and 37' respectively are disposed adjacent the opposite ends of the lowermost spool 20, but in spaced relation to the spool heads. As the star-shaped cam 47 continues to rotate, however the nozzles A and A' together with their associated labels will be caused to move inwardly and to simultaneously engage both ends of the spool. This inward movement is caused by tension springs 49, which springs are connected between brackets 50 and 50', secured on the upper ends of brackets 42 and 42' by any suitable means such as screws 52 and 52' respectively. It is evident that the shape of the star-shaped cam 47 will determine the time at which this inward movement of the nozzles ABCD and A'B'C'D' takes place as well as the time of withdrawal of these nozzles. In the present disclosure, the nozzles are permitted to suddenly move inwardly into engagement with the spool head under the force of springs 49 but are gradually withdrawn outwardly.

Attention is also called to the fact that the cam 47 continuously rotates. This rotation is effected by a chain of driven parts hereinafter described. The lower end of the shaft 48 has a sprocket 55 fixedly secured thereon (Figure 1), upon which a chain 56 is mounted. This chain 56 is also mounted upon a second sprocket 57 substantially of the same size, and which is fixedly secured upon another shaft 58 (Figures 1 and 2). The upper end of shaft 58 is journaled in a bracket 60, said bracket extending downwardly from the upper bed plate 12, and the lower end of the shaft 58 is rotatably mounted in a bracket 61.

said bracket 61 extending upwardly from the lower bed plate 11. A beveled gear 62 is fixedly secured on the lower end of the shaft 58 (Figures 1A and 2). This gear meshes with another beveled gear 63 substantially of the same size, said gear 63 being fixedly secured upon a main drive shaft 64 which, in turn, is rotatably mounted in bearings 65, 66 and 67.

Upon one end of the main drive shaft 64 a large gear 68 is fixedly secured, and this gear meshes with a pinion 69 (see Figure 3). Pinion 69 is rotatably mounted upon a shaft 70 supported by a bracket 71, said bracket 71 being secured to the end frame 10 by any suitable means such as bolts or rivets 72. Integral with pinion 69 is a pulley 73 upon which a suitable belt or other driving means is adapted to be mounted for driving the machine. Since the pulley 73 is constantly rotated it is evident that the cam 47 will likewise continuously rotate through the described connecting parts designated by reference characters 48, 55, 56, 57, 58, 62, 63, 64, 68 and 69. The rotation of cam 47 will cause the turrets 37 and 37' together with their associated nozzles to constantly reciprocate toward and away from each other and thereby engage the opposed ends of the lowermost spool head 20.

In the present embodiment of the invention the turrets 37 and 37' together with the associated nozzles are not rotating while the same are moved toward the spool heads. This non-rotating position is maintained until the labels have been applied to the opposed ends of the spool head. When it is desired to remove the spool from position the turrets are again rotated while the spool is clamped between the opposed nozzles to thereby expel the spool from lowermost position within the chute and allow the next succeeding spool to fall into its place.

As the nozzles rotate from stationary engaging position with the spool head the cam 47 tends to gradually separate the turrets 37 and 37'. After making substantially a 90° rotation the turrets again cease rotation with their proximate nozzles in separated positions relative to the lowermost spool in the chute. It is therefore seen that it is necessary to provide means for intermittently rotating the turrets 37 and 37' through angles of 90° so that the labels can be applied to the spool head while the turrets are not rotating.

Intermittent rotating means for turrets 37 and 37'

Figure 17 shows the timing of the nozzle and turret bodily movement with relation to the rotative movement of the turrets and nozzles.

It is here seen that the nozzles and turrets are stationary about 70% of the first quarter revolution of the main drive shaft 64. In other words, as shown in this diagram the nozzles and turrets are stationary about 35% of the first quarter revolution of shaft 64 and then the turrets and nozzles rotate through an angle of about 90° during the next succeeding 30% of the first quarter revolution of this same shaft 64. During the remaining 35% of the first quarter revolution of shaft 64 the nozzles and associated turrets are stationary. During this first quarter revolution of the main drive shaft 64 the turrets and nozzles are also moved bodily toward and away from the spool heads. In this same diagram it is shown the time during which the nozzles are engaging the spool heads. In other

words the nozzles are not rotating when they are bodily moved against the spool heads, and the nozzles remain in this engaged position until the turrets have rotated through a substantial angle to expel the spool (see Figure 15).

This intermittent rotation is produced by what is commercially known as a Geneva gear. In Figures 1A and 2 the construction of this Geneva gear is clearly illustrated and it is here seen that the lower portion of shaft 41 has fixedly secured therearound a suitable star-shaped disk 75, said disk having four radially disposed slots 76 therein spaced substantially 90° apart. Between the adjacent slots 76 the periphery of disk 75 has concave notches 77 cut therein, there being four of such concave notches. The radius of each of the concave notches is substantially the same as the outer radius of a second disk 78, which disk is fixedly secured around shaft 58 previously described. This disk 78 also has suitable concave notches 78a cut in the periphery thereof substantially at 90° apart. Disk 78 is secured upon the upper portion of a circular plate 79, said plate having extending upwardly therefrom a plurality of pins 80 of such diameter as will be capable of entering the slots 76 as the disks 78 and 75 rotate. The position of each of the pins 80 is substantially centered relative to each of the notches 78a in disk 78. It will be noted that the depth of the notches 78a is sufficient to clear the outermost tips of the star-shaped disk 75 during the rotation of the parts. In other words, as the shaft 58 rotates in a counter-clockwise manner in Figure 2 the pins 80 on the far side of main drive shaft 64, will enter the slots 76 in the disk 75, and upon further rotation of the shaft 58 the rotation of disk 75 and the associated shaft 41 will be produced. After the shaft 41 has been rotated through an angle of approximately 90° the slot 76 will be in a position to release the pin 80 and thereafter the disk 75 will remain stationary until the next succeeding pin 80 engages the next succeeding slot 76 in the disk 75. Then the same one-fourth revolution of shaft 41 will be repeated.

In Figure 1A it is seen that the shafts 41 and 41' have intermeshing gears 81 and 81' respectively mounted thereon. These gears have substantially the same diameter and therefore when one shaft 41 and its associated turret and nozzle mechanism is rotated the other shaft and its associated turret and nozzle will likewise be rotated an equal amount in the opposite direction.

The lower ends of shaft 41 and 41' are rotatably mounted in brackets 82 and 82' respectively. Disposed on the projecting portions of these shafts and beneath the bearings are compression springs 83 and 83', said compression springs being confined on this projecting portion by any suitable means such as collars 84 and 84' respectively. The purpose of providing the springs 83 and 83', and collars 84 and 84' is to permit the shafts 41 and 41', together with their associated turrets, to be pulled upwardly a substantial amount when it is desired to separate the turrets 37 and 37' from brackets 50 and 50'. For example it is often desired to inspect certain concealed slots, perforations and the like and also to lubricate the engaging surfaces between turret member 37 and the stationary bracket member 50 upon which the turret member rests. By employing the present construction this may be easily done by merely raising the shafts 41 and 41' while compressing springs 83 and 83'.

Label magazine and operating mechanism therefor

It should be borne in mind that the labels on each of the nozzles A to D inclusive are held in position by a suitable suction mechanism to be later described. This suction mechanism not only serves to hold the labels in contact with the ends of the nozzles, but also serves to withdraw the exposed label from a mass of labels which are disposed within a magazine.

Substantially at the same time a label is being moved against the end of the lowermost spool 20 by a nozzle, a label magazine is delivering a label to another nozzle which is disposed substantially 180° from the label applying nozzle. For example in Figure 17 it is seen that during the first one-quarter revolution of drive shaft 64 the label magazine first moves inwardly for a short time interval as indicated by the line entitled "Label magazine moving inwardly." During this time interval the turret and nozzles are not rotating. Then while the turret is still in a non-rotating position the label magazine reaches its innermost position and engages a nozzle, after which the magazine immediately moves in the opposite direction for a short time interval as indicated in Figure 17 by the line entitled "Label magazine moving outwardly." This back and forth movement continues in timed relation to the operation of the machine.

Since the turret 37 moves bodily toward and away from the spool head, and since the label magazine also moves back and forth substantially in alignment with the bodily motion of the turret it is necessary to time these movements so that the nozzles of the turret clear the end of the label magazine during rotation. With the above-mentioned remarks in mind a suitable sliding plate 85 has been mounted between the grooved guideways 44. Extending upwardly from the outer end of this plate is an L-shaped bracket 86 which has pivoted on the upper end thereof as at 87 a tubular magazine 88.

Magazine 88 has the left-hand end thereof open and the right-hand end thereof closed, in Figures 1 and 3, except for a small hole in the right-hand end which slidably receives a rod 89. Rod 89 has an enlarged head 90 on its end which is disposed inside the tubular magazine 88. Disposed around that portion of the rod 89 within the tubular magazine is a weak compression spring 91 which urges the head portion 90 inwardly at all times and thereby compresses a mass of labels 92 toward the open end of the magazine.

As a means for retarding the inward movement of the rod 89 and the head portion 90 a suitable braking device is employed. Figure 5 shows the braking device which is located on the left-hand end of the machine as viewed in Figures 1 and 3, but which is identical to the braking mechanism on the right-hand end. This braking mechanism comprises a lever 93' which is pivoted intermediate its ends as at 94' to a plate 95'. This plate is secured to the closed end of the magazine 88'. One end of the lever 93' has a friction band 96' on the upper side thereof which engages the periphery of the projecting rod 89'. As a further means for holding this friction band in engagement with the rod 89' a suitable torsion spring 97' is employed. This friction applying means is always engaging rod 89' when the magazine is in outermost position, that is, when the mass of labels 92' are out of engage-

ment with the turret nozzles. When the magazine is moved inwardly to engaging position with the spool 20, the lever 93' is rotated by a suitable stationary cam 98' to a position where the braking action will be relieved and therefore the force of the compression spring 91 will be permitted to compress the mass of labels 92 inwardly against the adjacent nozzle.

The cam 98' is formed on the upper end of a substantially Z-shaped member 99', said member being secured to one of the grooved guideways 44 by any suitable means such as stud bolt 100'. A slot 101' is provided in the bar 99' to permit adjustment of the position of cam surface 98'. An identical braking structure is associated with magazine 88, and is indicated by the same reference characters with the prime notation omitted. When the magazine has been moved inwardly the maximum amount to apply the innermost label to the associated suction nozzle, the magazine again moves outwardly at which time the levers 93 and 93' move off cam surfaces 98 and 98' respectively to instantly apply a braking action to rods 89 and 89'. The braking action will prevent the springs 91 from pushing the labels 92 out of the open end of the label magazines when the turret nozzles are not in position to receive them.

It is important that only one label at a time be removed from the mass of labels 92 within the magazine 88. When the magazine moves inwardly towards one of the nozzles to deliver a label the entire mass of labels is pressed against the nozzle as a result of the braking mechanism 92 to 97 inclusive being released and on account of the movement of the magazine and adjacent nozzle toward each other. When the magazine and labels are withdrawn a retarding means supplements the action of the braking means previously described to cause only the exposed label of the mass to be transferred to the suction nozzle and at the same time retain the remainder of the labels in the magazine.

This retarding means comprises a pair of oppositely disposed brushes 102 and 103 (see Figures 1 and 9), said brushes having one end thereof loosely secured to the outer periphery of magazine 88 as at 104 and 105 respectively. The bristles of brushes 102 and 103 penetrate oppositely disposed slots 106 in the inner end of magazine tube 88 and engage the innermost end of the mass of labels; consequently, when the magazine and labels are being withdrawn after having delivered one of the labels to the suction nozzle the bristles of these brushes will prevent additional labels from moving out the tube. At the same time the friction or braking mechanism previously described will relieve the inward pressure normally exerted by spring 91 upon the mass of labels. This braking mechanism will be applied to rod 89 immediately upon the beginning of the outermost movement of the label magazine. Resilient bands 106a serve to press the free ends of brushes 102 and 103 together against labels 92.

Attention is called to the fact that the magazine 88 may be rotated about its hinge point 87. Figure 1 shows two positions which these magazines may occupy. The dotted line positions of the magazines 88 and 88' are usually assumed when it is desired to refill the same with labels, and the bold line positions are occupied during normal operation. When in the bold line position the free end of the label magazine rests upon a second angle bracket 107 which is se-

cured to the upper side of plate 85 previously described.

The reciprocatory motion of the magazine 88 is produced by a mechanism which will now be described. By observing Figure 1 it will be seen that the bottom of plate 85 has a toothed rack 108 upon the lower face thereof, said rack meshing with a pinion 109 upon shaft 110. This shaft is rotatably mounted in a downwardly extending bracket 111 and has a lever 112 fixedly secured thereon. A link 113 has its upper end pivotally secured to the free end of lever 112, the lower end of said link being pivotally secured to a laterally extending arm 114 as at 115.

Arm 114 is secured to the upper end of a rod 116 which, in turn, is slidably mounted for vertical reciprocatory motion in bearings 117. These bearings are supported by side frames 10. Figures 1, 1A, 2 and 6 clearly show the structure of the rod 116. It is here seen that the lower end of the rod 116 has a horizontal leg 118 which rests upon a substantially square cam 119, said cam 119 being fixedly secured upon the main drive shaft 64 previously described. As a means for supporting the free end of laterally extending leg 118, a suitable diagonal brace 120 is provided. Also as a means for preventing rotative movement of leg 118 about rod 116 as a center, an L-shaped bracket 122 is provided, which bracket has a slot 123 in the upper end thereof for the reception of the end of the leg. This L-shaped bracket 122 is supported by the lower bed plate 11. In order to yieldably hold the horizontal leg 118 against the periphery of the square cam 119, a suitable tension spring 124 is provided.

As the main drive shaft 64 rotates the high and low sides of cam 119 will cause the rod 116 to rise and fall four times during each revolution. This motion of the rod 116 will serve to reciprocate label magazine 88 back and forth, that is toward and away from the turret 37 four times for each revolution of the main drive shaft, and consequently, four labels will be successively delivered to the suction nozzles A to D inclusive as the nozzles move to receiving positions. It is of course understood that each time the magazine 88 is advanced inwardly that a nozzle will be in a stationary position to receive the exposed label which is disposed in the magazine.

Label vacuum means

As heretofore stated a suction or partial vacuum is employed for holding the labels 92 upon the nozzles A to D inclusive while the nozzles are travelling from label receiving position to label applying position. During this travel the label rotates through an arc of approximately 180°, using shaft 41 as the center of rotation. In order to maintain a constant suction or partial vacuum upon the label during this travel it is necessary to first provide a suitable bore 130 in each of the nozzles A to D inclusive. Each of these bores communicate with a compartment 131 (Figures 9 and 13) which, in turn, communicate with a vertically disposed bore 132. Both the compartment 131 and the bore 132 are disposed in turret 37. Also it will be noted by observing Figure 13 that the bores 132 are arranged substantially in the arc of a circle, using the shaft 41 as a center.

Since the lower portion of turret 37 rests in face to face contact with the upper portion of bracket 50, the openings 132 will be closed by

the upper face of bracket 50 at least during a part of the revolution of the turret 37. These openings would be closed the entire revolution were it not for the provision of a semi-circular groove 134 in the upper face of member 50. Groove 134 is substantially 180° in length and has substantially the same radius as the circle upon which the bores 132 are located. The groove 134 begins at the label receiving position and ends at the label applying position. In other words, when one of the nozzles is disposed in stationary position and in the position for receiving a label 92 from the mass of labels in the magazine, one end of the circular groove 134 is communicating with a bore 132 and a compartment 131. At the same time the oppositely disposed nozzle, that is the nozzle located 180° from the label receiving nozzle, is disposed in a position for applying a label to the spool head. This oppositely disposed nozzle is communicating with the other end of the circular groove 134. The intermediate nozzle also has suction applied thereto to hold its respective label in position. When a nozzle rotates from the label applying position to label receiving position the suction is eliminated because the groove 134 is not located adjacent this path of travel.

Communicating with one end of groove 134 is a pipe 137, said pipe passing downwardly through bed plate 12 to a vacuum tank 138 (Figures 1, 6, 9, 13 and 14). Leading from the vacuum tank is another pipe 139 which extends horizontally and then downwardly to the suction end of a suitable air pump 140. This pump is positioned on the lower bed plate 11 and has a shaft 141 extending therefrom which is connected to a motor shaft 142 of motor 143, said motor also being supported by the lower bed plate 11. Pump 140 operates continuously to provide a continuous suction which results in a partial vacuum in the nozzles A to D inclusive. It is also noted that each nozzle is open during its travel from label applying position to label receiving position but once the nozzle is not in communication with groove 134 no suction will be present, but this nozzle is usually not in communication with the circular groove 134. Even though one or more of the nozzles should be open and in communication with the groove 134, the amount of suction produced by the pump is sufficient to still create an inward flow of air through the additional nozzles to hold labels thereon.

Label spray equipment

Figure 16 shows one of the labels 92 which is commonly used on spool heads for advertising and identification purposes. This label 92 has one face thereof coated with a suitable adhesive 149, said adhesive usually being dry so as to make it possible to place the labels side by side in a stack without one label adhering to the other. When using labels having a dried adhesive thereon it is necessary to provide means for rendering this adhesive effective before the label is applied to the spool head. In the present disclosure a suitable atomizing spray has been employed whereby water or other suitable liquid is applied to the dried adhesive 149, after the label has been positioned upon one of the nozzles and before the nozzle has reached label applying position. It is also necessary that the labels be placed in the magazine 88 in such a manner that when a label is withdrawn and positioned upon a nozzle the exposed surface of each withdrawn label will have the dried adhesive 149 thereon.

The spraying equipment in part, comprises a suitable receptacle 150 which is adapted to contain water or other suitable liquid for moistening purposes. Extending downwardly from the top of the receptacle 150 is a tube 151, the upper end of said tube being disposed substantially at the same elevation as the center of nozzles A to D inclusive. The end of an air pipe 152 is disposed in close proximity to the upper end of the pipe 151, said pipe 152 being also substantially in alignment with the plane of rotation of the nozzles.

When a blast of compressed air is emitted from the pipe 152 it blows over the upper end of pipe 151 and thereby draws the liquid upwardly through the pipe and atomizes the same. This atomized liquid is directed onto the label 92 which is disposed upon the adjacent nozzle. As the label travels from the label receiving position to the label applying position it passes through this spray and the adhesive 149 thereon is thereby moistened. When the label and nozzle reach a position opposite the spray on the travel from label receiving to label applying position, it is stopped for a short time interval to permit the adhesive to be properly exposed.

A suitable funnel-shaped member 154 is provided for converging the atomized spray after it leaves the upper end of pipe 151. This funnel-shaped member directs the spray upon the label carried by the nozzle.

Air is supplied to the pipe 152 by any suitable means such as pipe 155, fitting 156, hose 157, valve 158, hose 159, reservoir 160 and pipe 161, said pipe 161 being connected to the outlet side of air pump 140. The air which is expelled from this pump is forced into reservoir 160, up through the pipe 159, valve 158, hose 157, fitting 156, hose 155 and into pipe 152 (Figures 1, 1A, 2, and 6).

It is only necessary that the atomizing equipment operate while the label is in position for receiving the spray; consequently, means have been provided for cutting the compressed air on and off by the manipulation of the valve 158 (Figures 1, 6 and 8). The valve has a plug 162 rotatably mounted therein, said plug having a transverse bore 163 through which the air passes. The plug 162 extends to the exterior of the valve 158 and has a lever 165 extending therefrom, the free end of said lever having a link 166 pivotally secured thereto, which link is pivotally secured as at 167 to arm 114' previously described. Each time the rod 116' moves up and down the valve 158 is cut on and off to intermittently permit air to escape from pipe 152 and thereby direct an atomized spray onto the label 92 upon the adjacent nozzle.

Presser mechanism for the applied labels

After the labels have been applied to the opposed ends of the spools, the spools are released from the nozzles and allowed to roll first upon inclined platform 35 and then to inclined platform 32. Occasionally, the nozzles do not properly apply the labels to the spool heads. In order to insure that the applied labels are firmly pressed into position on the spool heads an additional pressing operation is provided. This pressing operation is effected when the labeled spool is resting at the upper portion of the platform 32 in the position shown in Figures 3 and 6. As heretofore stated the spool is held in this position for the subsequent pressing operation by the free end of bar 31, which bar forms a part of the spool escapement mechanism.

Suitable presser heads 170 and 170' usually formed of some resilient material such as rubber or the like, are provided (Figures 4, 10, 11 and 12). Presser head 170 is mounted upon the innermost end of a tube 171 which, in turn, is slidably mounted in brackets 172 and 173, said brackets resting upon the upper bed plate 12.

Secured around the tubular member 170 at a point intermediate the brackets 172 and 173 is a collar 174. This collar is connected to the upper end of a bell crank 175 by means of a bolt 176. In order to permit the free end of the bell crank to impart straight line reciprocatory motion to the tubular member 171 without binding any of the parts, slot 177 is provided in the upper end of the bell crank for the reception of the bolt 176. The bell crank 175 is pivotally mounted as at 178 to a downwardly extending bracket 179, which bracket is supported by the bed plate 12. In order to provide the necessary clearance for the vertical leg of bell crank 175 a slot 180 is cut in the bed plate 12.

The horizontal leg of bell crank 175 has its free end pivotally secured to the upper end of a vertically disposed link 181, and the lower end of this link is pivotally secured to the arm 114' as at 182. As the square cam 119 and main drive shaft 64 rotate, the rod 116 and associated arm 114 will reciprocate, up and down, in the manner heretofore described. This reciprocation will impart horizontal reciprocation to the tubular member 171 and to the presser head 170 to thereby cause the label upon the spool head to be again pressed more firmly in position. The time of engagement of the spool head by the member 170 is substantially the same as the time of engagement by the turret nozzles of the spool heads; however, there is a slight variation in the time of engagement and the time of release, as will be seen by observing the timing diagram in Figure 17.

Unlabeled spool capturing mechanism

If for any reason a label becomes detached from the spool heads it is necessary to perform the labeling operation again. Heretofore it has been necessary for an operator to inspect each end of each labeled spool to ascertain whether or not the label was properly applied. The present device has means whereby the absence of a label upon a spool head will cause the spool to be rejected and transferred by way of another route to a segregated position. It is seen by observing Figures 11 and 12 that each of the spools 20 has a longitudinal bore 20a there-through. Each end of this bore 20a is covered by a label 92 when the spool is properly labeled. If a label is omitted from one end of the spool the hole is, of course, left open.

As a detecting means for ascertaining whether or not a label has been omitted from the end of the spool head, a suitable conical plunger 185 is provided, said plunger 185 being slidably mounted in the inner end of tubular member 171. A hole 186 is provided in the presser head 170, said hole being of sufficient diameter to permit the conical plunger to pass therethrough without friction. This plunger 185 has a rod 188 integral therewith, said rod having a weak compression spring 189 therearound which normally tends to force the plunger 185 outwardly through the bore 186. This compression spring has the right-hand end thereof in Figure 10 abutting a transverse wall 190 within the tubular member 171.

Extending downwardly from the right-hand end of rod 188 is an arm 191, said arm being slidably mounted in the slot 192 cut in the tube 171. A cord 193 has one end thereof fastened to the lowermost end of arm 191, said cord passing around a pulley 194 which, in turn, is rotatably supported by the outermost end of tubular member 171. This cord has its other end secured to bracket 173 and at 195.

The purpose of the cord 193 and pulley 195 is to normally hold the conical plunger 185 in retracted position when the tubular members 171 is in an outermost position. When the tubular member 171 and 171' are moved inwardly to spool engaging position, such as shown in Figure 11, the pulleys 194 and 194' will also be moved inwardly thereby permitting the plungers 185 and 185' to move against the label on the spool head under the force of the weak compression springs 189. If a label is not present, such as shown in Figure 12, the plunger 185 will be moved inwardly into the bore 23a. Then when the tubular member 171 moves outwardly again, the plunger will pull the spool off the platform 32. Upon further outward movement of the tubular member the cord 193 will serve to retract the plunger within the tubular member and thereby release the spool and permit it to fall downwardly. A suitable opening 197 is provided in the bed plate 12 through which the rejected spools are permitted to fall after having been released by the retracting plunger 185.

In the drawings and specification, there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

We claim:

1. Apparatus for applying labels to articles comprising two separated rotary members having a plurality of spaced fixed suction nozzles, means for intermittently rotating said rotary members and nozzles, a label magazine for each rotary member and adapted to hold a plurality of labels, one side of each label having dried adhesive thereon, means for simultaneously transferring a label from each magazine to one nozzle of each rotary member during the time interval between said intermittent rotations, spray heads for directing moisture upon the adhesive face of said transferred labels during a succeeding time interval between said intermittent rotations, means for feeding an article between the two proximate nozzles of said separated rotary members, and means for simultaneously moving the separated rotary members together with the proximate nozzles, and sprayed labels, toward the opposite sides of said article during another succeeding time interval between said intermittent rotations to thereby apply labels to the article.

2. Apparatus for applying labels to articles comprising two separated rotary members having a plurality of spaced fixed suction nozzles, means for intermittently rotating said rotary members and nozzles, a label magazine for each rotary member and adapted to hold a plurality of labels, one side of each label having dried adhesive thereon, means for simultaneously transferring a label from each magazine to one nozzle of each rotary member during the time interval between said intermittent rotations, spray heads for directing moisture upon the adhesive face of said transferred labels during a

succeeding time interval between said intermittent rotations, a valve for controlling the spray heads, means for closing said valve when the rotary members and nozzles are rotating and for opening the valve when the rotary members and nozzles are stationary, means for feeding an article between the two proximate nozzles of said separated rotary members, and means for simultaneously moving the separated rotary members together with the proximate nozzles and sprayed labels, toward the opposite sides of said article during another succeeding time interval between said intermittent rotations to thereby apply labels to the article.

3. Apparatus for applying labels to articles comprising a rotary member having a plurality of spaced fixed nozzles, suction means for said nozzles, means for intermittently rotating said rotary member, a magazine for holding a plurality of labels, each of said labels having a dried adhesive face remotely disposed from said rotary member, means for transferring a label from said magazine to one of said nozzles during a time interval between said intermittent rotations, means for spraying moisture on the exposed adhesive face of said transferred label during a succeeding time interval between said intermittent rotations, and means for moving the rotary member towards the article to apply the sprayed label onto the article during another succeeding time interval between said intermittent rotations.

4. Apparatus for applying labels to articles comprising two separated rotary members, each rotary member having a plurality of spaced fixed nozzles, suction means for said nozzles, means for intermittently rotating said rotary members and nozzles, a label magazine for each rotary member and adapted to hold a plurality of labels, one side of each label having dried adhesive thereon, means for simultaneously transferring a label from each magazine to one of the nozzles of the associated rotary member during the time interval between said intermittent rotations, means for simultaneously spraying the exposed adhesive faces of said transferred labels during a succeeding time interval between said intermittent rotations, means for feeding an article between said separated rotary members, means for simultaneously moving the separated rotary members together with the proximate nozzles and sprayed labels toward the opposite sides of said article during another succeeding time interval between said intermittent rotations to thereby apply labels to the article.

5. Apparatus for applying labels to articles comprising two spaced turrets, each turret having a nozzle, suction means for releasably holding an adhesive label upon the respective nozzles, means for feeding an article between said turrets, means for rotating said turrets step by step to position the nozzles and associated labels adjacent opposite sides of said article, means for simultaneously moving said turrets together with the nozzles and labels toward said article during the time interval between said step by step rotations to thereby apply the labels to the articles.

6. Apparatus for applying labels to articles comprising two relatively movable spaced turrets, each turret having a nozzle, suction means for releasably holding an adhesive label upon the respective nozzles, means for feeding an article between said turrets, means for rotating said turrets step by step to position the nozzles and associated labels adjacent opposite sides of said

article, a slidable bearing supporting each of said turrets; a rotary cam disposed between said bearings whereby the nozzles will be simultaneously moved toward and away from opposite sides of said article during the time interval between said intermittent rotations to thereby apply labels to the article.

7. Apparatus for applying labels to articles comprising a rotary member having a plurality of spaced fixed nozzles, suction means for said nozzles, means for intermittently rotating said rotary member, a magazine for holding a stack of labels, each of said labels having a dried adhesive face remotely disposed from said rotary member, means for moving said magazine and said stack toward said nozzle during the time interval between said intermittent rotations to cause the exposed label on one end of the stack to be transferred to one of the nozzles, a spring-pressed plunger engaging the other end of said stack of labels, and cam operated means for arresting the pressure of said plunger upon the stack of labels when the magazine moves away from the nozzle and for releasing said plunger against the stack of labels when the magazine is moving toward the nozzle.

8. Apparatus for applying labels to articles comprising a rotary member having a plurality of spaced fixed nozzles, suction means for said nozzles, means for intermittently rotating said rotary member, a magazine for holding a plurality of labels, each of said labels having a dried adhesive face remotely disposed from said rotary member, means for transferring a label from said magazine to one of said nozzles during a time interval between said intermittent rotations, means for spraying moisture on the exposed adhesive face of said transferred label during a succeeding time interval between said intermittent rotations, and means for moving the rotary member together with the sprayed label towards the article to apply the sprayed labels to the article during another succeeding time interval between said intermittent rotations to thereby apply the label to the article.

9. Apparatus for applying labels to articles comprising two separated rotary members, each rotary member having a plurality of spaced fixed nozzles, suction means for said nozzles, means for intermittently rotating said rotary members and nozzles, a label magazine for each rotary member and adapted to hold a plurality of labels, one side of each label having dried adhesive thereon, means for simultaneously transferring a label from each magazine to one of the nozzles of the associated rotary member during the time interval between said intermittent rotations, means for simultaneously spraying the exposed adhesive faces of said transferred labels during a succeeding time interval between said intermittent rotations, means for feeding an article between said separated rotary members, and means for simultaneously moving the separated rotary members together with the proximate nozzles and sprayed labels toward the opposite sides of said article

during another succeeding time interval between said intermittent rotations to thereby apply labels to the article.

10. Apparatus for applying labels to articles comprising two spaced turrets, each turret having a nozzle, suction means for releasably holding an adhesive label upon the respective nozzles, means for feeding an article between said turrets, means for rotating said turrets step by step to position the nozzles and associated labels adjacent opposite sides of said article and means for simultaneously moving said turrets together with the nozzles and labels toward said article during the time interval between said step by step rotations to thereby apply the labels to the article.

11. Apparatus for applying labels to articles comprising a rotary member having a nozzle, suction means for releasably holding an adhesive label upon said nozzle, means for intermittently rotating said member to position the nozzle and associated label adjacent said article, and means for bodily moving the rotary member together with the nozzle and labels, toward the article to thereby apply the label to the article during the time interval between said intermittent rotations.

12. Apparatus for applying labels to articles comprising a rotary member, fixed suction means for releasably holding a label upon said member, means for intermittently rotating said member and suction means, means for rendering said label adhesive during a time interval between said intermittent rotations, and means for bodily moving the rotary member together with said suction means and label toward said article during a succeeding time interval between said intermittent rotations to thereby apply the label to the article.

13. Apparatus for applying labels to articles comprising two spaced turrets, each turret having a nozzle, suction means for releasably holding an adhesive label upon the respective nozzles, means for feeding an article between said turrets, means for rotating said turrets step by step to position the nozzles and associated labels adjacent opposite sides of said article, means for simultaneously moving said turrets together with said nozzles and labels toward said article during the time interval between said step by step rotations to thereby apply the labels to the article.

14. Apparatus for applying labels to articles comprising a rotary member, fixed suction means for releasably holding a label upon said member, means for intermittently rotating said member and suction means, means for rendering said label adhesive during a time interval between said intermittent rotations, means for bodily moving the said rotary member together with said suction means and label toward said article during a succeeding time interval between said intermittent rotations to thereby apply the label to the article.

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