

Oct. 14, 1958

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2,855,845

PRESS FOR PRINTING ON CYLINDRICAL ARTICLES

Filed April 5, 1954

4 Sheets-Sheet 1

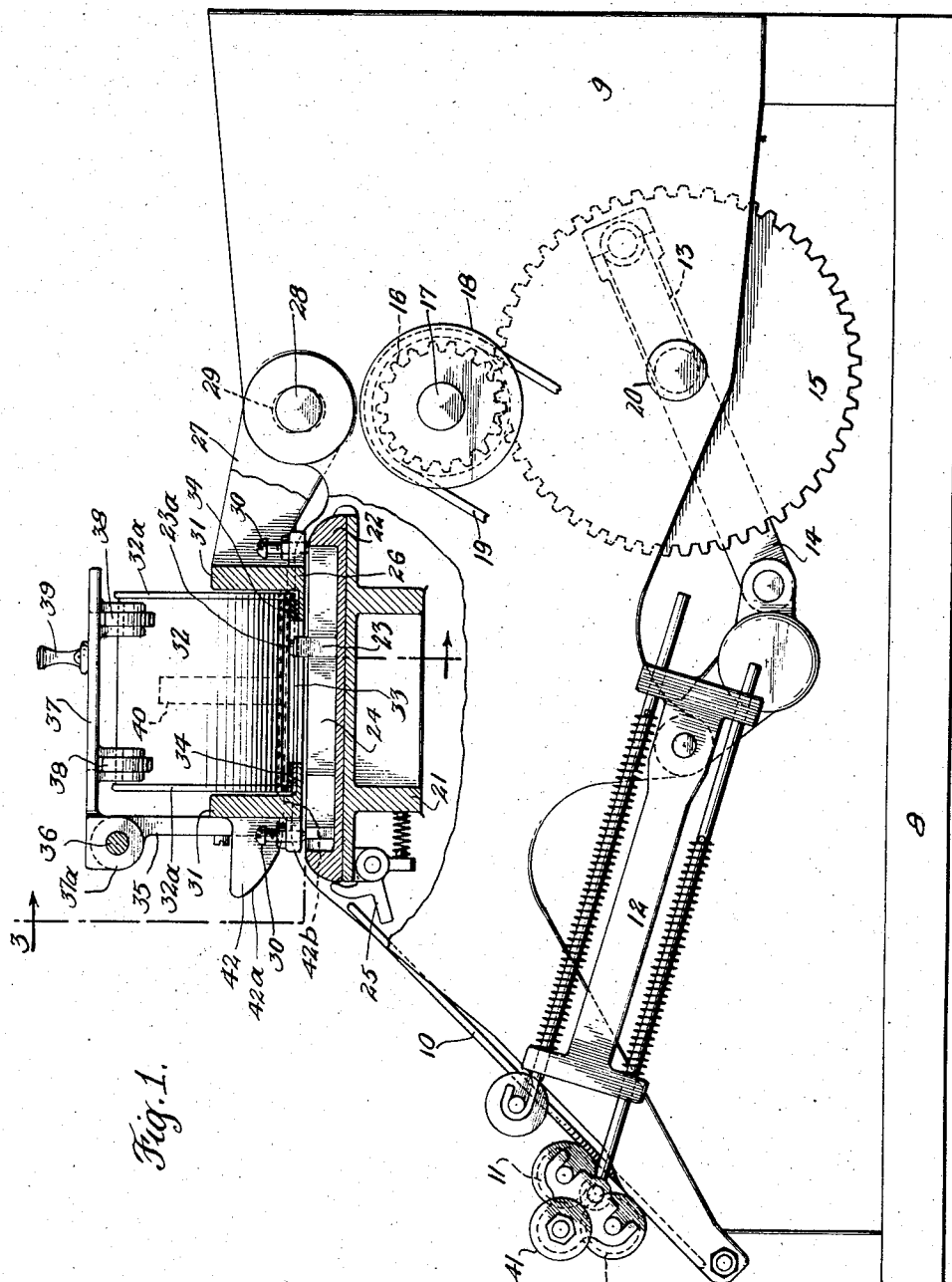


Fig. 1.

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4 Sheets-Sheet 2

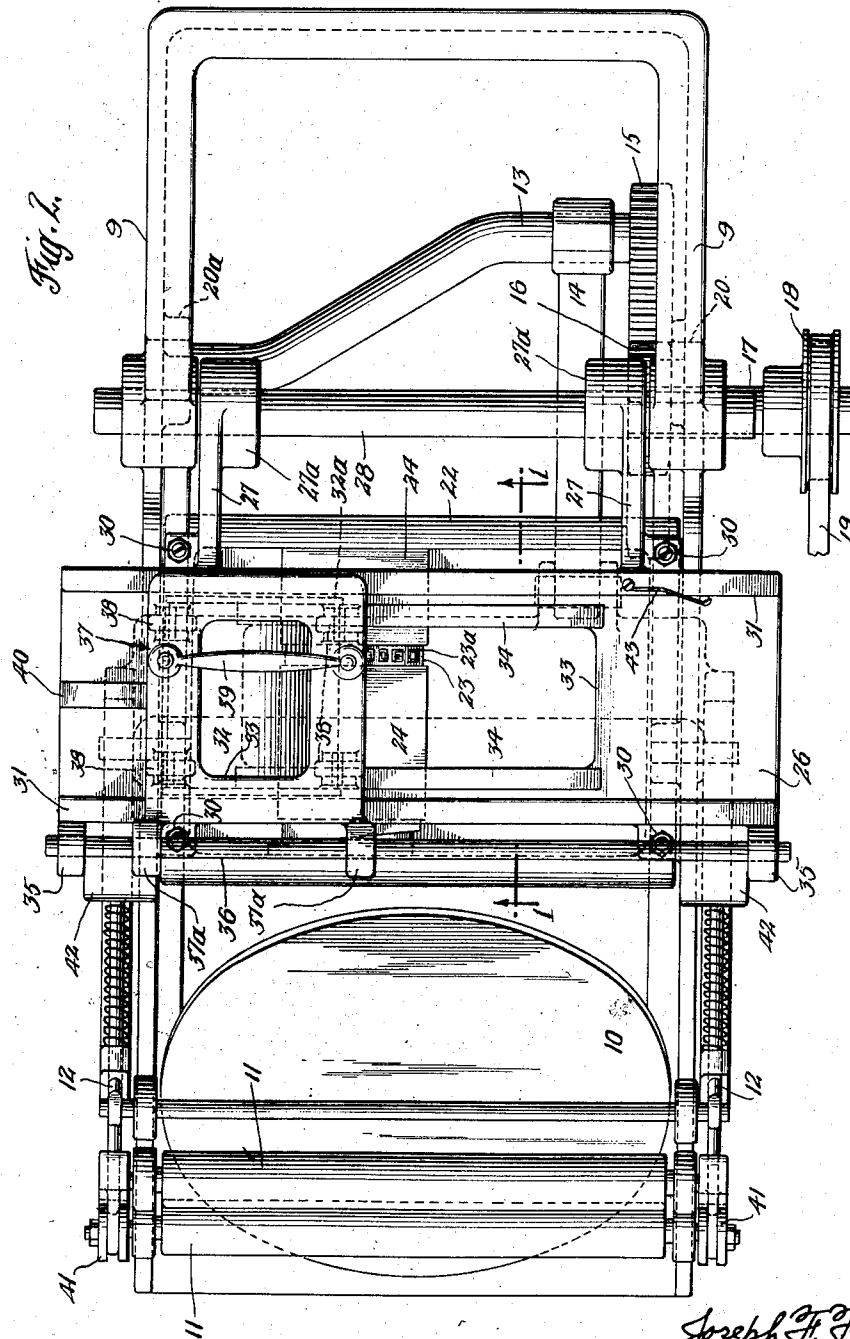


Fig. 2

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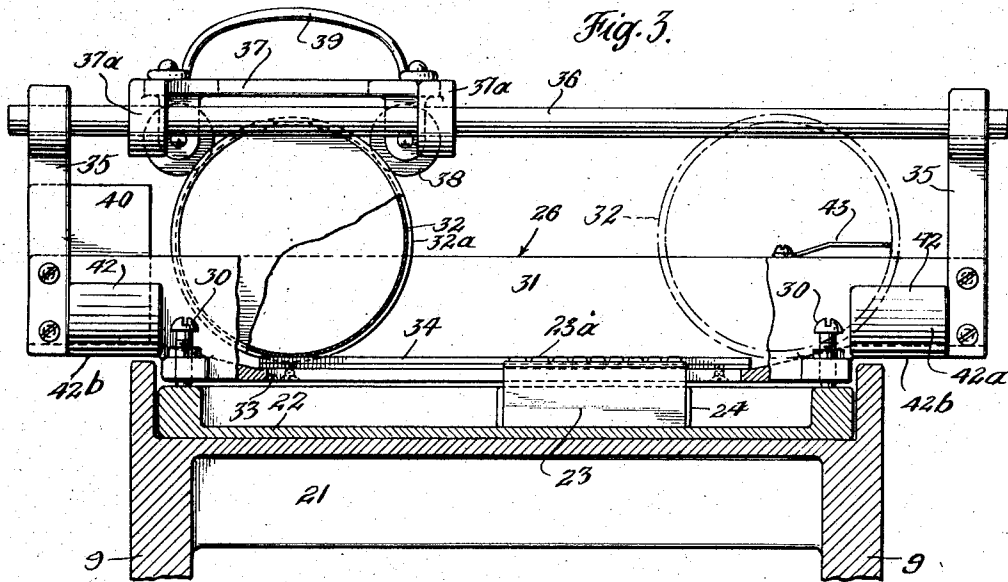
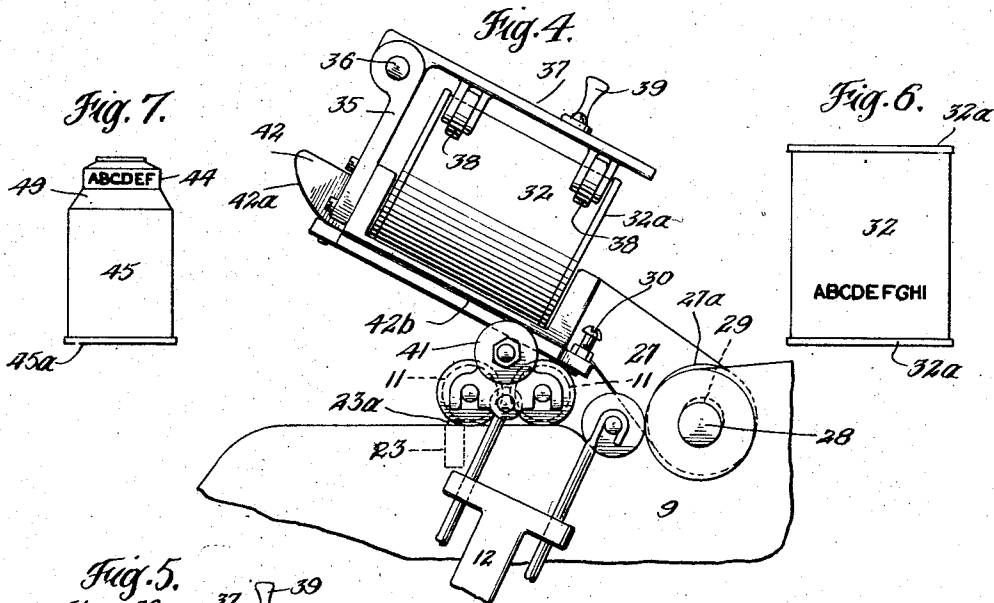
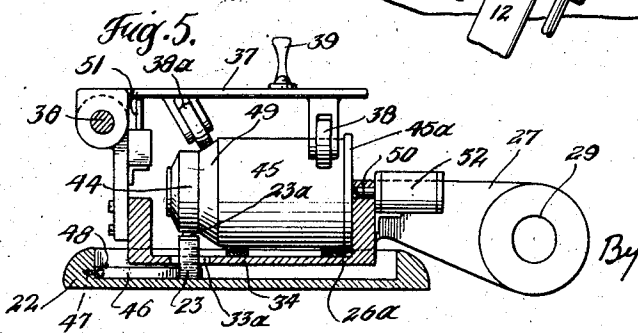
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PRESS FOR PRINTING ON CYLINDRICAL ARTICLES

Filed April 5, 1954

4 Sheets-Sheet 3



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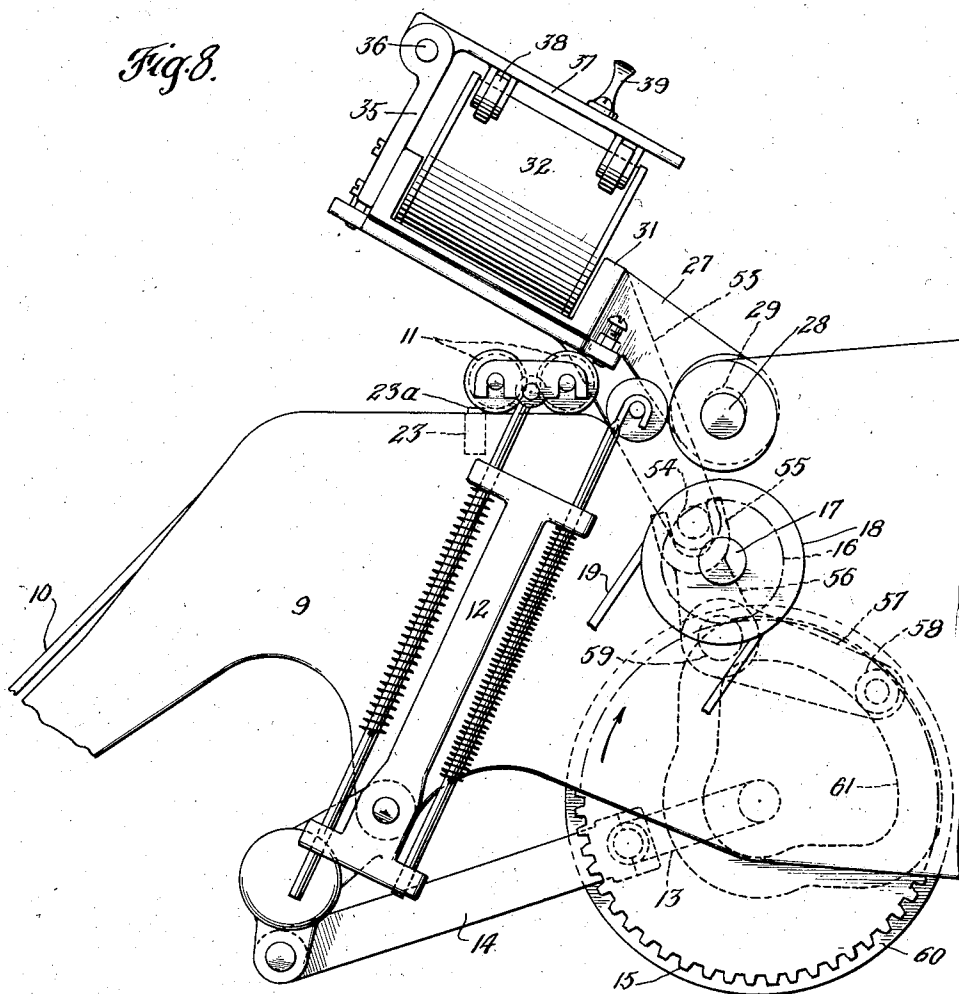
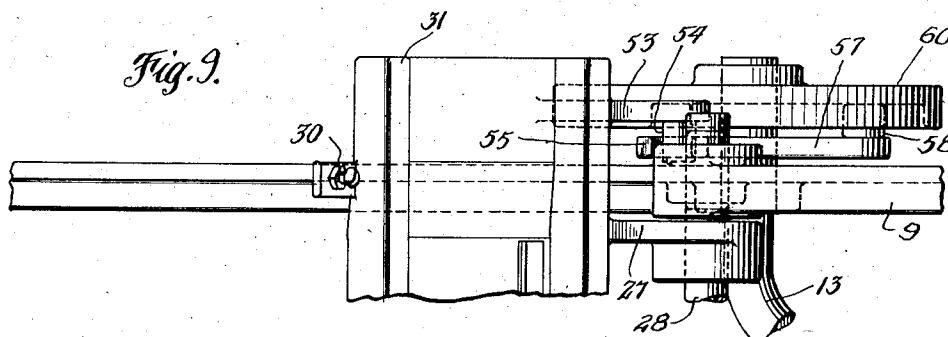
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PRESS FOR PRINTING ON CYLINDRICAL ARTICLES

Filed April 5, 1954

4 Sheets-Sheet 4



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PRESS FOR PRINTING ON CYLINDRICAL ARTICLES

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Application April 5, 1954, Serial No. 420,771

7 Claims. (Cl. 101—39)

This invention relates to the provision of a press which is particularly designed for applying printed material to the surface of cylindrical articles. It has been developed for and is especially useful in connection with printing on the surface of cylindrical cans. It is now common in industry to employ cans of various kinds and finishes in the packaging of a great variety of goods. For example, lithographed cans present a neat appearance and have considerable sales appeal. However, cylindrical cans present a labelling problem which assumes serious proportions especially in industries requiring a very large number of cans of different sizes and different identifying markings. A typical example is the paint industry which may require thousands of different labels either to accommodate different size cans or to indicate colors. In some situations also dates and batch numbers are important. Because of the variety and number of labels needed in such an industry it has generally been customary to apply printed labels to the cans, i. e., labels which are printed on paper or other material in flat condition and then wrapped around the cans and adhesively secured in one way or another.

As noted above, however, cylindrical cans are highly desirable in modern packaging but to provide the many hundreds and sometimes thousands of differently pre-labelled cans is an almost impossible task. Nevertheless, attempts to employ such pre-labelled cans have been frequently made but in industries like the paint industry this always leaves some final information which must be applied to the can either immediately before or right after it has been filled. For example, the color of the paint must generally be added and where this is necessary it has been customary to use hand stamps or small labels which, of course, involves a tremendous amount of hand work and requires a great deal of care so that the can is properly identified and mistakes avoided.

Another objection to the practice of applying printed labels, especially to paint cans, is the fact that the labels are frequently displaced, torn or otherwise damaged so that it is no longer possible to read the label to determine the contents.

With the foregoing in mind, the chief object of my invention will be more fully appreciated. This object is to provide a machine or press for printing upon the surface of the can whatever identifying or descriptive markings may be desired and this with perfect uniformity from can to can which latter has not been possible with the hand stamping or marking heretofore in use.

It is also an object of my invention to adapt familiar press construction and printing techniques to the special problem of printing upon cylindrical surfaces. To this end I have redesigned what is familiarly known as a "job press" so that it can be used in the printing of cylindrical objects instead of the usual flat sheets of paper or board for which such a press is ordinarily intended. In fact, I make use of the inking plate, the inking rollers and the type chase of such a press but have completely altered the pivoted platen which is characteristic of a

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press of this kind so that it becomes in effect a holding member for the articles to be printed, as will further appear. The details of my improved press are illustrated in the accompanying drawings wherein

5 Figure 1 is a side elevational view with the upper portion in section as taken on the line 1—1 of Figure 2;

Figure 2 is a plan view of Figure 1;

Figure 3 is an enlarged cross-sectional view taken substantially on the line 3—3 of Figure 1;

10 Figure 4 is a fragmentary elevational view showing the work holding member of my improved press in the position to which it is moved when the inking rollers pass over the type face;

Figure 5 is a fragmentary cross-section of a modified form of work holding member by means of which printing can be applied to the narrower portion of a can having different diameters;

Figures 6 and 7 are side elevations of cans printed on my improved press;

20 Figure 8 is a partial side view illustrating a modification in the mechanism for moving the work holding member; and

Figure 9 is a fragmentary plan view of the structure shown in Fig. 8.

25 From the drawings it will be seen that I have arranged my press in a generally horizontal position as distinguished from the vertical or generally upright position characteristic of the familiar job press. A suitable housing and supporting structure having a base 8 and sides 9, carries at the left, as viewed in Figure 1, an inking plate 10 over which pass a pair of inking rollers 11 of familiar construction. The rollers are mounted on an operating frame-work 12 of a type which is well known to those skilled in this art, which frame-work is moved by a crank 13 through the medium of a connecting rod 14 in a manner which is quite customary in job presses of this kind. The crank is mounted near the periphery of the large gear 15 which is driven by the pinion 16. The pinion is keyed to a shaft 17 having a bearing in the side of the frame 9 which is adjacent the large gear 15 (see Figure 2). On the outer end of the shaft 17 a driving pulley 18 is keyed which latter, in turn, is driven by a belt 19 coming from some suitable source of power, not shown. The large gear 15 is mounted upon a stub shaft 20 which projects inwardly from the adjacent side portion of the frame 9. A bearing 20a for the crank coaxial with the stub shaft 20 is provided in the opposite side portion of the frame 9.

35 Supported between the side members of the frame 9 on the structural work 21 is the type chase 22. Within the opening in the chase is mounted the type 23 held in place by the customary furniture 24—it being understood, of course, that the type will include whatever material it is desired to print upon the article as will further appear. The chase is held in place by the toggle mechanism 25 in a manner customary in this art.

40 The articles to which the printing is to be applied are carried in a specially designed work holding member 26 having a pair of spaced arms 27, by means of which the member is pivoted upon the pin or rod 28 extending between the side members of the frame 9, as shown most clearly in Figure 2. The arms 27 have enlarged hub portions 27a within which are formed the apertures or openings 29 through which the pivot pin 28 extends and it will be noticed that these openings 29 are slightly elliptical in shape as indicated by the dotted lines in Figure 1, all this for the purpose of providing a slight degree of lost motion in a generally up and down direction as viewed in Figure 1, whereby to permit of a slight degree of adjustment of the work holding member to chase relationship. This adjustment can be effected by

means of four set screws 30 one at each corner of the platen.

The back of the work holding member is formed as a channel 31 of a width which is just sufficient to loosely accommodate the length of the article to which the printing is to be applied—in the present instance a cylindrical can 32. The base of the channel is cut out to form an opening or passageway 33 through which the type projects upwardly so as to bring the type face 23a into the plane of the cylindrical surface of the can 32 upon which the printing is to be placed. At each side of the opening 33, suitable tracks 34 are provided along which the can is adapted to roll during the printing operation, these tracks preferably being equipped with rubber or other friction treads as indicated by the cross-hatching in Figure 1. Inspection of Figure 1 will show also that the tracks are arranged so as to provide a slight space therebetween and the adjacent sides 31 of the channel for accommodation of the end beads 32a of the can. It should also be noted that the surfaces 33a at the ends of the opening 33 are inclined upwardly away from the ends of the tracks 34 for a purpose which will appear more fully hereinafter.

On the back of the work holding member I also provide a framework 35 for supporting a rod 36, on which latter is mounted for sliding movement a carriage member 37. The carriage member has trunnions 37a which embrace the rod 36 with a fit sufficiently loose to permit easy sliding movement of the carriage 37 along the length of the rod 36. On its under face the carriage is provided with a series of four friction rollers 38 which embrace the can, as shown most clearly in Figure 3. It will be understood, of course, that the carriage 37 can be swung upward and downward on the rod 36 so as to permit introduction of the cans 32. On its upper surface the carriage has a handle member 39 by means of which it can be manipulated. At the left hand end, as viewed in Figure 3, the back of the holding member may be provided if desired with a suitable stop member 40 in the middle of the channel against which the cans can be placed at the start of the printing operation.

In order to permit the inking rollers 11 to roll across the type face 23a, it is necessary, of course, that the holding member be moved upwardly on its pivot sufficiently far to provide the necessary space within which to accommodate the rollers. This is provided for in the following way. The ink roller assembly is provided at each end with a contact piece 41 which pieces engage under the lugs 42 which project outwardly in the direction of the approaching rollers, there being a curved contacting surface 42a on the bottom of each of these lugs, as clearly shown in Figures 1 and 4. The surface 42a merges into a flat trackway surface 42b—one at each end of the holding member—along which surfaces 42b the contact pieces 41 are adapted to move as the inking rollers approach their farthest advanced position, as shown in Figure 4, in which latter figure the holding member is shown in its uppermost position where it is out of the way of the inking rollers. When the inking rollers return to their lower position, as viewed in Figure 1, gravity, of course, will return the holding member to the printing position shown in Figures 1, 2 and 3.

The foregoing description refers primarily to Figures 1 to 4 inclusive and at this point it is believed that a brief summary of operation will be helpful. The operator stands at the right of the machine as viewed in Figures 1 and 2 and, facing toward the advancing inking rollers, he grasps the handle 39 of the carriage 37 with one hand, lifts it up and then, with his other hand, places a can upon the tracks 34 against the stop 40. The carriage is then lowered in position upon the can so that the wheels 38 will embrace the upper portion of the can as it lies on the tracks 34. In the meantime, the driving mechanism has been set in operation and after the inking rollers have moved upwardly and across the type face and then down-

wardly to their initial position, as viewed in Figure 1, in which position the holding member is in its horizontal or printing position, the carriage is then moved to the operator's left which rolls the can along the tracks 34 over the type, thus effecting the required imprint on the surface of the can. The can will then be raised somewhat to the dot and dash line position shown in Figure 3 with its beads 32a resting part way up on the inclined surface 33a, where the spring finger 43 will slip behind a bead 32a on the can and thus prevent all possibility of the printed can from rolling back over the type face 23a. This operation requires but a moment of time and then the carriage 39 is moved back to its initial position, as shown in Figures 1 and 2, is again lifted and another can is placed in position for the start of the printing operation. As the second can follows the first can it will force the first can to complete its movement up the subjacent inclined surface 33a and out of the channel 31 and discharge it at the left of the machine into suitable mechanism supplied for the purpose which, however, is not illustrated herein because it forms no part of the present invention. By inclining the surface 33a as shown the structure of the platen is made to clear the tracks 34 along which travels the inking roller assembly, it being understood, of course, that the required path of travel of the inking rollers is predetermined by the need to align the inking surfaces with the face of the type.

Figure 6 illustrates the can with the printing thereon it being understood, of course, that as much or as little of the surface of the can can be imprinted as circumstances require and it is to be noted in connection with the foregoing summary of operation that the rolling movement of the can during the printing operation is in a direction which is transverse to the direction of motion of the inking rollers and that the lines of type extend in this transverse direction.

Turning now to Figures 5 and 7, I will describe briefly the modifications required to print on the narrow neck portion 44 of a special type of can 45 which has a body of larger diameter than the neck, as clearly shown in these figures. Cans of this type are used for special packaging and in many instances it is desirable to mark the narrow neck portion with some identifying insignia and to repeat the mark at several places around the circumference of the neck so that when the cans are stacked in a pile on their sides, as often happens in the stores, one of the identifying marks will always be uppermost and, therefore, readily readable.

An arrangement to accommodate this type of can and effect the desired imprint upon the neck thereof is shown in Figure 5, wherein the work holding member 26a is formed to extend a short distance into the opening in the chase 22. The tracks 34 are placed so as to engage the wider diameter body portion 45 and the type 23 is positioned to project through the opening 33a in line with the narrow neck portion 44 of the can. The type may be held in place by a narrow yoke-shaped strap 46 each leg of which has a foot portion 47, through which a screw 48 is passed to hold the strap in position. Any other suitable arrangement could be adopted for this purpose and it will be understood that the necessity for a special type holding means arises because of the fact that the work holding member extends down into the chase opening and thereby prevents employment of the customary furniture. This holding means, however, is a matter of detail. The important point is to use standard type so that the type face 23a always projects upwardly to the same horizontal position.

In order to hold a can of this type firmly in position during the printing operation, I prefer to arrange one pair of rollers 38a at an angle so that they will bear against the inclined shoulder 49 which connects the main body 45 of the can with the narrow neck 44. The other pair of rollers 38 remain as before.

In the foregoing, it will be seen that cans of different

configuration or different size can all be accommodated and printed in my improved machine by simple variations in the construction of the holding member and to this end I make the holding member mounting pin 28 readily removable so that holding members can be changed without trouble.

In Figure 5 I have illustrated an additional feature to which I wish to call attention. This is the solenoid actuated stop pin 50 which, under normal conditions, will be spring held in position to contact the outer periphery of the bead 45a of the can. This normal position will always obtain when the carriage 39 is in its upward position so that the pin 50 will act as a stop for the purpose of locating the can at the proper position on the track to begin the printing operation. When the carriage is lowered to the position shown in Figure 5 it will actuate the plunger 51 of a switch mechanism which controls the coil for the solenoid 52, the latter being the solenoid which moves the pin 50. When the circuit is energized the pin 50 will be withdrawn so that the can 45 is free to roll along the track under the influence of the operating carriage 37 as before described.

The modification shown in Figures 8 and 9 relates to a direct cam actuated mechanism for moving the holding member up and down instead of relying upon the motion of the inking rollers for this purpose. In these figures the interengaging surfaces 41, 42a and 42b are eliminated and in place thereof the holding member is provided with a downwardly projecting operating arm 53 carrying a laterally projecting pin 54 at its lower end. This pin fits loosely in the yoke-shaped end 55 of the upwardly extending arm 56 of a bell crank member, the other arm 57 of which carries a cam follower pin 58. The bell crank is mounted to pivot near its central region upon the pivot pin 59. Cooperating with the pin 58 is a cam member 60 rigidly mounted on the end of the crank 13 opposite to the end where the large gear 15 is attached.

In the position of the parts illustrated in Figures 8 and 9, the holding member has been moved by the cam slot 61 operating on the pin 58 so that it is raised high enough for the inking rollers 11 to pass therebetween and accomplish the inking operation in the manner already described. As the cam member 60 continues to rotate in the direction of the arrow shown in Figure 8 it will be seen that the cam slot 61 provides a period of "dwell" which holds the holding member in its upper position, as illustrated. At the same time the inking rollers start to move away under the influence of the crank 13 and when they have cleared the horizontal surface and have started down the incline over the inking plate 10 the cam follower 58 will reach that point in the cam slot 61 where the arm 57 will be moved downwardly which, of course, moves the arm 56 to the right and the arm 53 to the left which swings the holding member 27 downwardly around the pin 28, the yoke and pin construction 55-54 being sufficiently loose to permit such motion. The cam follower 58 will then approach the other "dwell" portion of the cam groove 61 and at this time the inking rollers, of course, are in their lowermost position as illustrated in Figure 1. Adequate opportunity is thereby provided within which the operator may move the carriage to effect the necessary printing operation on the can.

In connection with Figures 8 and 9, essentially the same type of printing action takes place, namely, the printing is applied during rolling motion of the can in a direction transverse to the direction of travel of the inking rollers. However, in these figures the holding member is positively actuated, as described, by mechanism which functions in synchronization with the mechanism for operating the inking rollers and both mechanisms are actuated from a single source of power.

I claim:

1. A press for printing on cylindrical cans comprising in combination, a type chase, an inking plate, an inking roller assembly, a track at each side of the chase along which the inking roller assembly is adapted to move, a work holding member mounted to move upwardly and downwardly with respect to the chase, means for raising the holding member and moving the inking roller assembly along said tracks to effect inking of the type and then to return the assembly and lower the holding member, said holding member being provided with an opening through which the printing face of the type is adapted to project, a pair of spaced tracks for the cans arranged on the back of the holding member transversely of the inking roller tracks, and a carriage mounted on the back of the holding member for back and forth movement in the direction of said can tracks, said carriage being adapted to roll the cans along their tracks from one side to the other of the press to effect the printing operation.

2. A press according to claim 1 wherein the carriage is pivoted on its mounting to swing upwardly to permit placement of a can in its starting position and downwardly to engage the can for rolling it along its tracks.

3. A press according to claim 1 wherein the holding member is provided with a movable stop member adapted to hold the can in its starting position on its tracks and, further, wherein means are provided for moving the stop member to release the can when the carriage is lowered preparatory to rolling the can along its tracks.

4. A press according to claim 1 in which the roller assembly is provided with a lifting member for raising the holding member during the inking operation.

5. A press according to claim 1 wherein a spring finger is provided for engaging the can and preventing reverse rolling thereof after the printing operation has been completed.

6. A press according to claim 5 wherein each can so held by the spring finger is released for discharge by the succeeding can.

7. A press for printing on cylindrical cans comprising in combination, a type chase, an inking plate, an inking roller assembly, a track at each side of the chase along which the inking roller assembly is adapted to move, a work holding member mounted to move upwardly and downwardly with respect to the chase, means for raising the holding member and moving the inking roller assembly along said tracks to effect inking of the type and then to return the assembly and lower the holding member, said holding member being provided with an opening through which the printing face of the type is adapted to project, a pair of spaced tracks for the cans arranged on the back of the holding member transversely of the inking roller tracks, and movable can-engaging means supported in spaced relation to the tracks, said last means being constructed and arranged to contact the curved wall of a can and roll it along the tracks from one side to the other of the press to effect the printing operation.

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