L. JAMES.

CAN PRINTING MACHINE.

APPLICATION FILED NOV. 29, 1913.

1,106,712.

Patented Aug. 11, 1914.

3 SHEETS—SHEET 1.

Fig. 1.

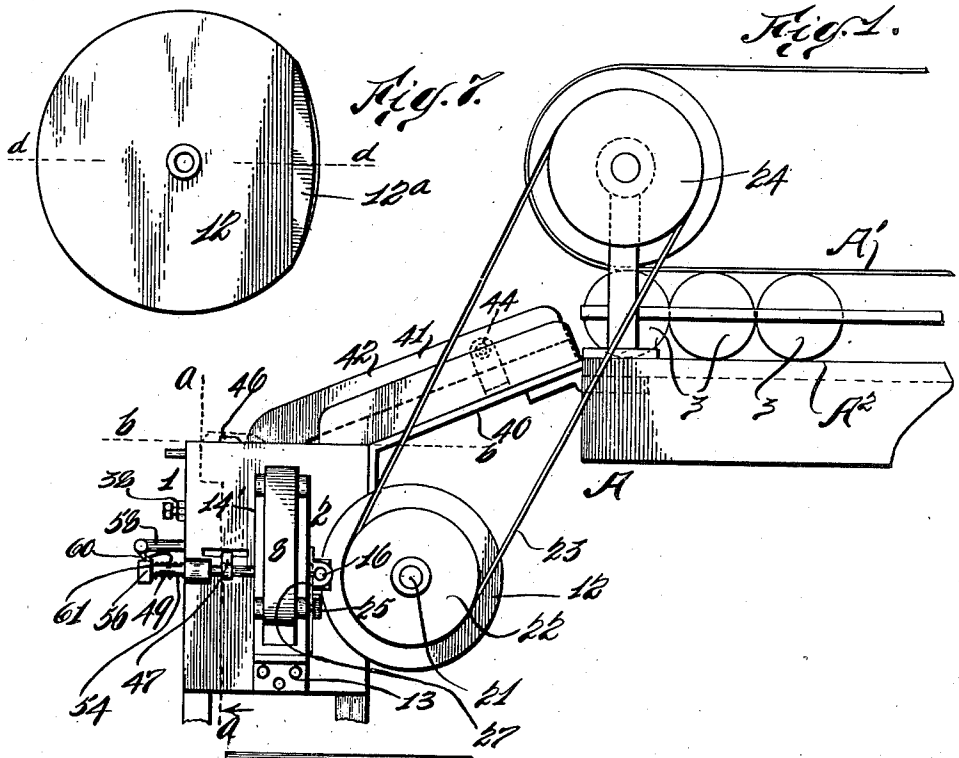
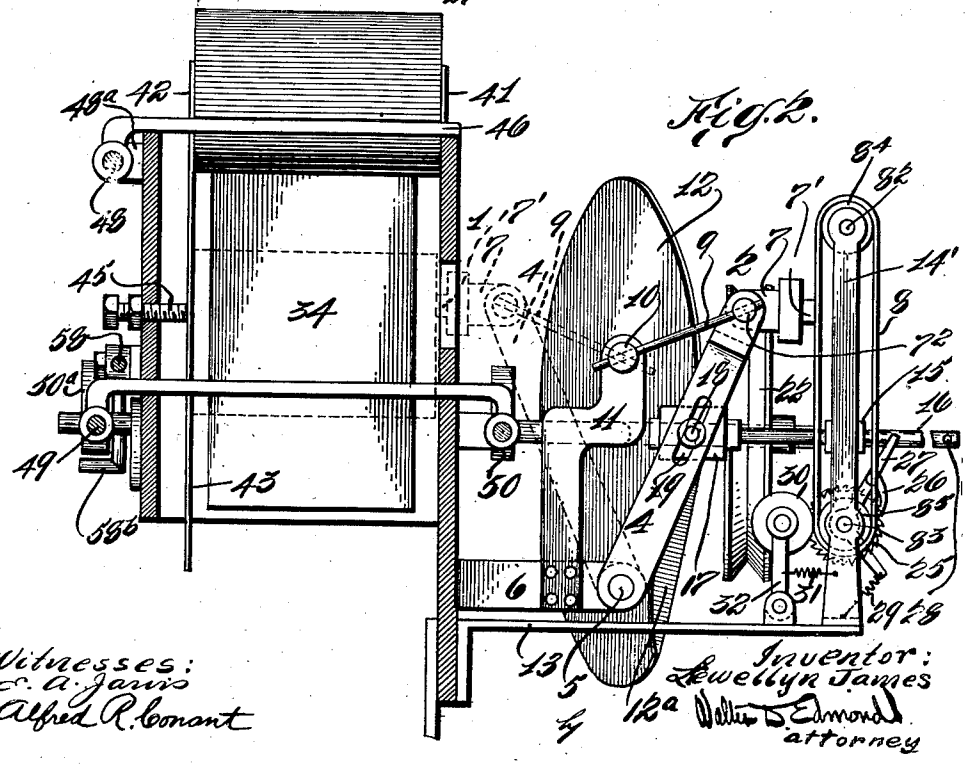


Fig. 2.



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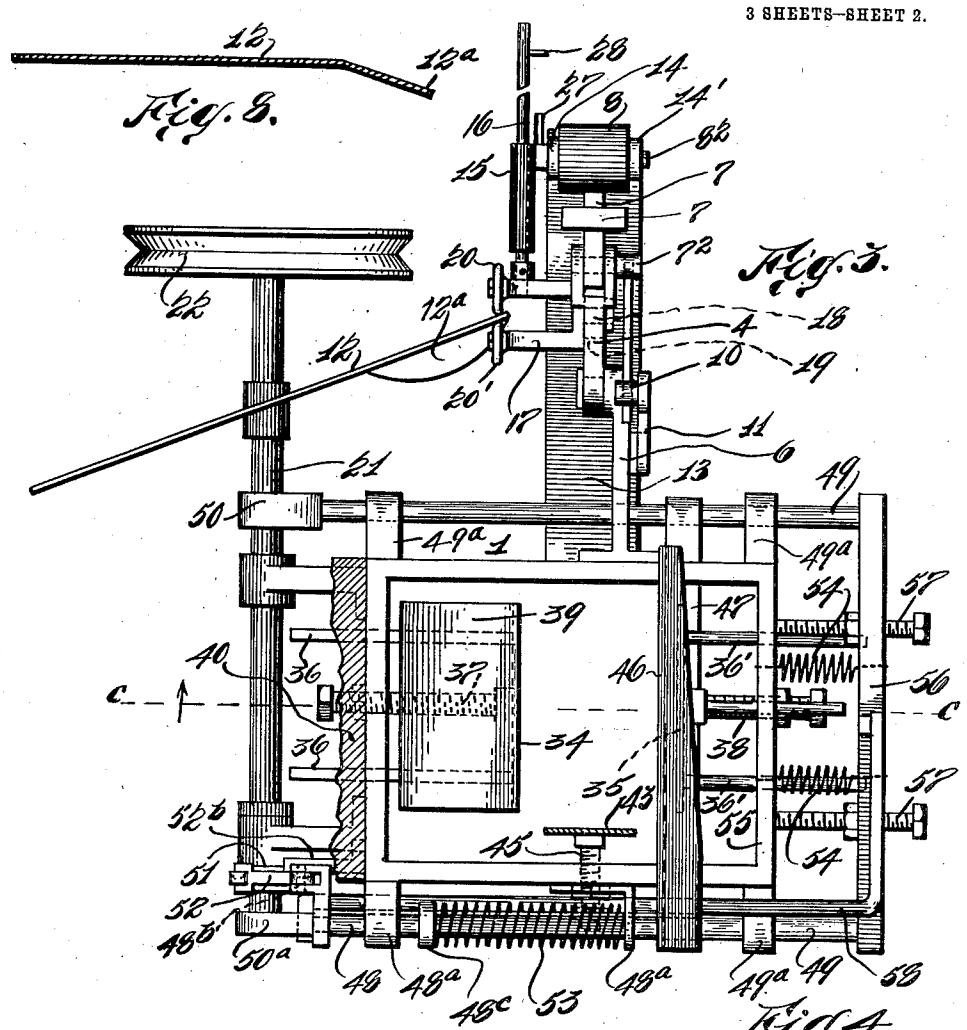
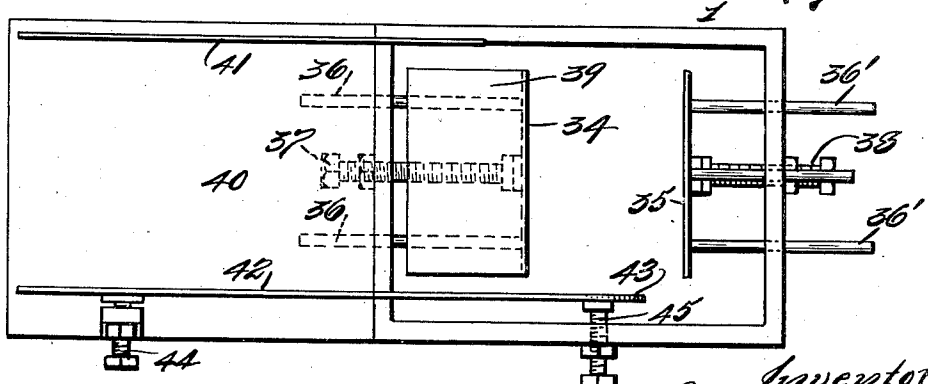


Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 5.

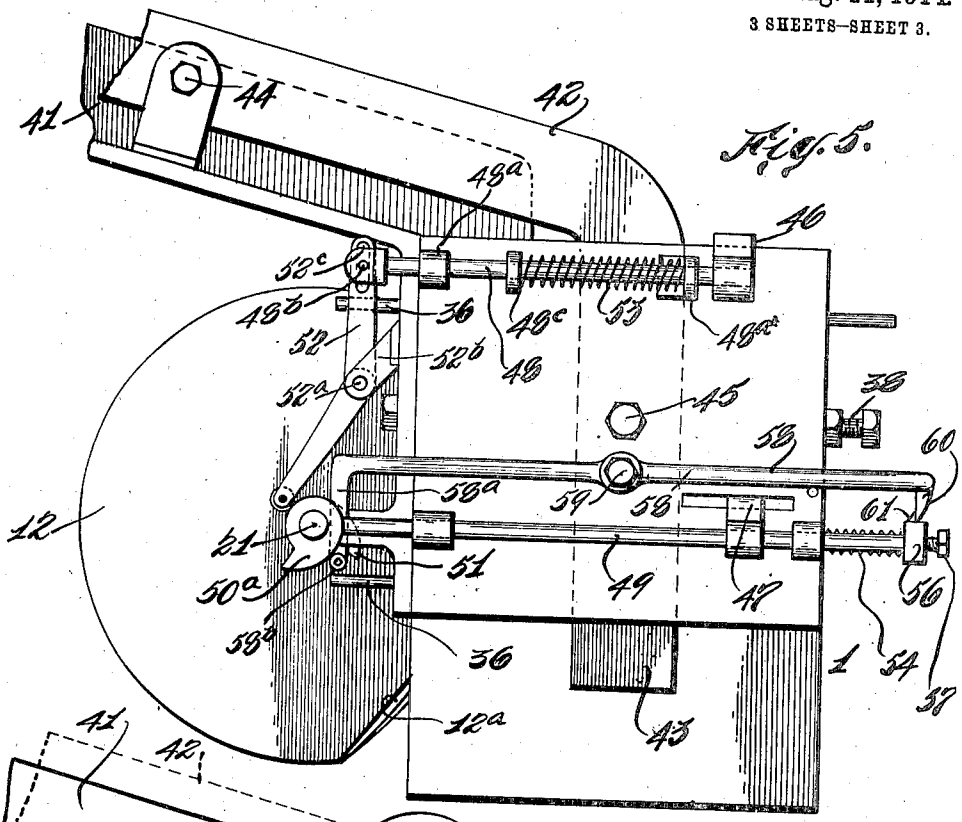
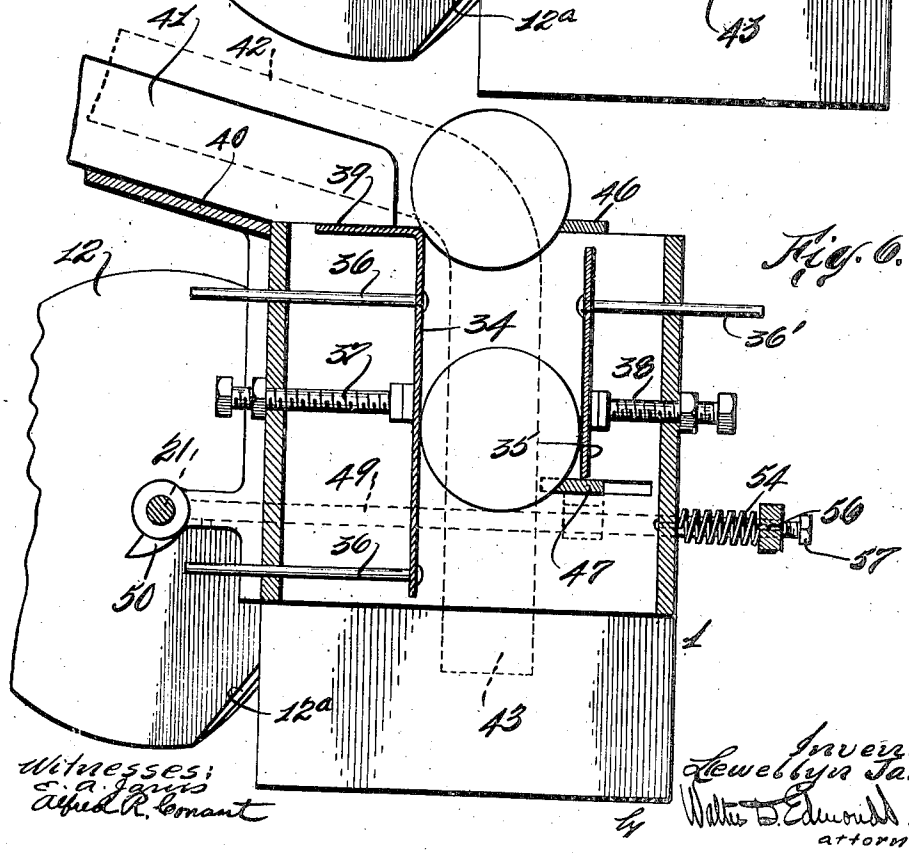


Fig. 6.



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UNITED STATES PATENT OFFICE.

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CAN-PRINTING MACHINE.

1,106,712. Specification of Letters Patent. Patented Aug. 11, 1914.

Application filed November 29, 1913. Serial No. 803,679.

To all whom it may concern:

Be it known that I, LLEWELLYN JAMES, a subject of the King of Great Britain and Ireland, residing at Tilsonburg, in the Province of Ontario and Dominion of Canada, have invented a new and useful Can-Printing Machine, of which the following is a specification.

My invention relates to improvements in machines employed to print, or otherwise inscribe or mark, on the ends, or heads, of cylindrical cans, such, for example, as are used in storage and transportation of condensed milk, such distinguishing letters, words, numerals, or emblems, as may be desired, and the objects of my improvements comprise the effecting of such markings without dependence on any manipulation of the cans by the operators, and with resulting greater speed, precision, and economy than heretofore, in other words to, for example, properly end-mark the previously manufactured, charged, sealed, and side-labeled, cans, without the operators touching them, after another machine has applied to, and pasted upon, their cylindrical sides the usual paper labels, this result of my improvements being, I believe, unprecedented.

I attain my said objects by the mechanisms illustrated in the accompanying drawings in which—

Figure 1 is an end view or elevation of my end-marking machine, shown, for better understanding of my invention, as connected with a well known type of machine which has just previously applied and pasted a paper label upon the cylindrical side of the can; Fig. 2 is, on enlarged scale, a side elevation of my machine viewed from the left of Fig. 1, certain parts being shown in vertical section taken on the dotted line *a*—*a* of Fig. 1, seen in the direction of the arrow traversing said line; Fig. 3 is a top view, or plan, on more enlarged scale, showing some parts in horizontal section taken on the line *b*—*b* of Fig. 1; Fig. 4 is a top view, or plan, to show more clearly the guides for the cans, certain other elements being omitted; Fig. 5 is, on more enlarged scale, a view, in elevation, of the end of my machine opposite to that shown in Fig. 1; Fig. 6 is a longitudinal vertical sectional view taken on the dotted line *c*—*c* of Fig. 3 seen in the direction of the arrow traversing said line, and indicating also, by dotted lines, the positions of the guide 42 and its extension 43, these parts being between said line *c*—*c* and the observer; Fig. 7 is a side, perspective, view of the bent cam disk detached; Fig. 8 is a central cross section of Fig. 1 on the dotted line *d*—*d* of the latter;

Similar reference numerals refer to similar parts throughout the several figures.

My automatic can-printing machine comprises a rectangular conduit 1, having therethrough a downwardly extending pathway for the cans, and, co-acting with said conduit and the therewith related stops hereinafter described, an end-marking mechanism designated comprehensively by the reference numeral 2, (Fig. 1). My machine is, in this instance, supported stationarily, by any convenient means, in juxtaposition to the delivery end, A, of one of the well known machines employed to apply, and paste, a label to the cylindrical side of the can. The cans, 3, are, as usual, automatically delivered from said labeling machine by aid of an endless belt A′, which, actuated as usual, contacts the sides of the cans to roll them out of the machine on the runway A^2. Reference is thus made to a labeling machine merely to exemplify concretely the capacity of my machine to operate consecutively upon a procession of cans continually issuing from any well known source, or can-manipulating instrumentality, the said procession being automatically diverted into my machine by means hereinafter described.

My end-marking devices, 2, comprise an oscillatory arm 4, (Figs. 2 and 3) one end of which is rotatably supported on a pivot 5, carried by a bracket 6, secured to one side of the conduit 1. A block, 7, carrying any desired type, or types, 7′, composed preferably of hard rubber, is, by means of a pivot, 7^2, also carried by said block, and journaled in said arm, carried oscillatably by the latter.

8 is an ordinary endless traveling type-inking ribbon, or tape, against which the type, 7′, are impelled to ink them intermediate each marking thereby of an end of each can, see Fig. 1. To so mark, or print, the arm 4 and block 7 are oscillated simultaneously into the positions indicated in dotted lines in Fig. 2 by means, which I provide as follows, viz:—As the arm 4 is oscillated, the block is also oscillated, or rotated through an arc of 180°, by aid of a lever, 9,

secured to the pivot, 7^2, and extending slidably through a rotatable pin, 10, journaled in a bracket, 11, carried by the bracket, 6. To oscillate the arm, 4, as and when required, I provide a rotatory disk, 12, and means operatively connecting said disk with said arm as follows:—a bracket, 13, (Fig. 2), carried by the conduit, 1, carries the posts, 14, 14′, (Figs. 2 and 3) in which are journaled shafts, 8^2, 8^3, carrying respectively the pulleys, 8^4, 8^5, by which is carried and moved the inking tape, 8. The post, 14, (Fig. 3), carries a bracket, 15, in which is horizontally slidably mounted a rod, 16, carrying a bracket, 17, carrying a pin, 18, which passes loosely through a slot, 19, in the arm, 4. The bracket, 17, also carries two rollers, 20 and 20′, (Fig. 3), between which rotate the sides of the disk, 12, adjacent its periphery. A horizontal rotary shaft, 21, carries the disk, 12, the major part of which is disposed in a plane inclined to the longitudinal axis of said shaft. The shaft, 21, also carries a pulley, 22, actuated by aid, as usual, of a belt, 23, (Fig. 1), which operatively connects said pulley with a driven pulley, 24, located near the delivery end A of the labeling machine. The construction described is such that rotation of the shaft 21 causes one side of the disk 12, adjacent its periphery, to bear, during part of said rotation, with gradually increasing pressure against one of the rollers, say 20, thereby gradually approximating the type to, and forcing it against, the tape, 8, to receive a charge of ink. Further rotation causes the opposite side of the disk to bear with like gradual pressure against the other roller, 20′, thereby gradually withdrawing the now inked type from the tape and causing it to approximate, and bear with gradually increasing pressure, against the end of the can supported in position to receive the imprint as will be hereafter described. The graduated character of the type movements thus secured is of very great importance, not only as regards the resulting effective charging of the ink upon the type, but, also, particularly as regards the perfection of the ink imprint made upon the can, the operation of the mechanism being thus closely simulative of the most skilled manual labor. The greater the radius of the disk, within reasonable limits, say not less than six, nor more than twelve inches, the greater the delicacy with which the ink is manipulated. Moreover, I find it preferable to construct the disk of material which is to a slight extent yielding and resilient, such, for example, as sheet steel, whereby corresponding increased yield, and resilience, is imparted to the aforesaid inking and printing pressures, thus even more closely simulating manipulation by the most skilled operators.

Intermediate each inking thereby of the type, the ink-carrying tape 8 is advanced a step by any convenient means, as for example by aid of a ratchet gear, 25, (Fig. 2), carried by the shaft, 8^3, and a therewith coacting pawl, 26, carried by a bell-crank-lever, 27, loosely carried by said shaft and one arm of which extends into the path of a pin, 28, carried by the rod, 16, and the other arm of which is held normally yieldingly retracted by a spring, 29. A tape-inking roller, 30, (Fig. 2), saturated as usual with ink, is constantly yieldingly forced against the tape, 8, by a retractile spring, 31, connected with the swinging frame, 32, in which said roller is journaled, and with the post, 14′.

I provide means to automatically arrest and hold, in turn, each can of the procession continually advancing from the labeling machine, in exactly required register with the can-marking member, or inked type, during the impression of the latter against the end of the can by aid of the previously described mechanisms, which, without aid and coöperation of such can-arresting and holding means, would prove comparatively incapable of attaining the objects of my invention. Within the rectangular conduit-box, 1, are, adjacent opposite sides thereof, two oppositely and perpendicularly disposed guide plates, 34, 35, (Figs. 3, 4 and 6), supported adjustably, to establish with exactness boundaries of the downward pathway of differently diametered cans, by means of therewith respectively connected guide pins, 36, 36′ slidably mounted, and threaded spindles 37 and 38 screwably held, in the walls of the conduit respectively adjacent said plates. The plate, 34, carries, at its upper end, a thereto rectangularly disposed shelf, or table, 39, (Figs. 3 and 6) to exclude cans from the interspace between said plate and the thereto adjacent wall. The conduit, 1, is also provided with a thereby partly supported inclined table, 40, (Figs. 1, 4, 5, and 6), constituting a downward runway for the cans from the labeling machine, the delivery end of which runway connects with the therefrom sub-disposed downward pathway of the cans through said conduit, the construction and disposition being such that the cans roll automatically from the labeling machine into the conduit.

To guide the cans during their descent and prevent their falling prematurely from the table, 40, I provide the latter with a thereby supported stationary guard plate, 41, and an adjustable guard rail, 42, the latter carrying a therefrom downwardly projecting extension, 43, which passes through the conduit, 1, the said projection serving not only as a guide for the cans during their descent through the conduit, but, also, as a backing to hold them against

the graduated pressure against their ends imparted by the type, 7′, while printing as hereinbefore described. Adjustability to suit cans of different lengths is imparted to the guard rail, 42, and its extension, 43, by any convenient means, as, for example, by adjusting screws, 44, and 45 (Figs. 4, 5, and 3). To control the automatic movement of the cans through the conduit, 1, *i. e.* to arrest and temporarily hold each can of the procession when and where required, I provide automatic stops, 46 and 47, (Figs. 3, 5 and 6). These stops consist of horizontally movable bars, 46 being normally disposed to prevent a can from entering the pathway of the conduit, and 47 so as to project into and bar said pathway at a point below 46, where the can thereby arrested will be held in register with the type during printing.

My means for automatically retracting the stops from the pathway when and as required are as follows:—The stop 46 is carried by a rod, 48, and the stop 47 by two rods, 49, which rods are respectively slidably horizontally carried by ordinary brackets, 48ª, 49ª, carried by the walls of the conduit 1, (Figs. 3, 5 and 6). Required horizontal movements are imparted to the rods 49 by aid of cams, 50, 50ª, and to the rod 48 by aid of a cam, 51, carried by the shaft 21, (Figs. 3, 5 and 6). The operative faces of the cams 50, 50ª, are shaped and disposed to bear directly against the ends of the rods 49 so as to force the latter backward, and thus the stop 47 out of the pathway at each rotation of the shaft, 21. The cam 51 bears operatively against one arm of a lever, 52, (Figs. 3 and 5), pivotally supported, as at 52ª, on a bracket, 52ᵇ, carried by the conduit, 1. The opposite arm of said lever contains a slot, 52ᶜ, through which projects slidably a pin 48ᵇ carried by the rod 48, (Fig. 5). The rod 48 is restored to normal position after each retrogression imparted by the cam 51 by means of a compressed spiral spring 53, which encircles the rod and bears against one of the brackets, 48ª, (Fig. 3), and against a collar, 48ᶜ, carried by the rod, while the rods 49 after each actuation thereof by the cams 50, 50ª, are retracted to normal position by means of retractile spiral-springs, 54, (Fig. 3), secured at one end to a wall, 55, of the conduit, 1, and at the other to a cross head, 56, which connects the outer ends of said rods (Fig. 3) and is provided with adjustable stop-pins, 57, bearing against the wall of the conduit whereby is limited the extent of pull imparted by the springs 54. To prevent the weight of a can, when it falls, by gravity, through the pathway of the conduit, from where released by retraction of the stop, 46, to where arrested by the stop, 47, from overcoming the pull of the springs 54, and thus disabling the stop 47 from effectively holding the can for printing, I provide a latch comprising a rod, 58, oscillatably supported by a pivot, 59, carried by a wall of the conduit 1. One end of the rod is provided with a keeper, 60, which normally engages a catch, 61, on the cross head 56. The opposite end of the rod has a downward extension, 58ª, carrying a roller 58ᵇ disposed in the path of the operative face of the cam 50ª, (Fig. 5) which by bearing thereon just prior to actuating the rod 49, oscillates the bar, thus lifting the latch and releasing the cross head 56 to permit retraction of the stop 47 from its normal projection into the pathway of the conduit.

The cams, 50, 50ª, on the one hand, and the cam 51, on the other, are so proportioned and set, relatively to each other, as to insure that the stop 46 remains in normal, closed, position during the arrestation, holding and release of a can by the stop 47, and that the stop 46 be opened only while the stop 47 is in its normal position projecting into the pathway. I also prefer to so shape the disk 12 as to insure that the type 7′ remains stationary while the stops 46 and 47 are in motion. This I accomplish by imparting to a minor portion, 12ª, of the disk 12, a bend, or angle, such that said portion, while passing between the rollers 20 and 20′, is disposed in a plane rectangular to the longitudinal axis of the shaft 21 which, as aforesaid, carries said disk and the cams 50, 50ª and 51. The bend 12ª referred to is indicated in Figs. 7 and 8, and its disposition to the shaft 16 in Fig. 2, the result of which, relatively to the other co-acting devices in the organized machine, is such as to suspend reciprocation of the rod 16, and thus movement of the type, while such bent portion of the disk is rotating between the rollers, 20, 20′, and the cams and springs are effecting reciprocation of the stops 46 and 47. My said expedient for suspending, as required, the cam action of the disk enables the latter to be constructed of the desired large radius, and to be actuated by the same shaft as the cams 50, 50ª and 51, without disturbing the rapidity, smoothness, and graduated character, of the operation of the machine, and results also in a great economy of otherwise required parts and instrumentalities.

The operation of my machine will be obvious from the foregoing. The cans roll, one by one, in an endless procession, from, in this instance, a can-labeling machine, down the inclined table 40 to where met, and arrested, by the stops 46, on retraction of which, one can is permitted to drop down the pathway of the conduit, and, by the smart return of which to normal position, the next-following can is held back, while the latter's predecessor is arrested, and held in required position for printing, in the pathway, by the

stop 47. Through rotation of the disk by the same shaft which has actuated the other means therewith connected to impart said movements to the stops, the type is inked, rotated, and oscillated to a position in register with the end of the can so held by the stop 47, whereupon the type is impressed against that end by the graduated, and preferably yielding, movement referred to, and thereafter, with the same desirable quality of movement, withdrawn, and reversely rotated and oscillated to and from the ink-tape, and, during a pause in said movement, the can last printed is dropped by the stop 47 and another admitted by the stop 46. The operation is entirely automatic, the cans requiring no handling whatever from start to finish, and its results as regards speed, perfection of printing, and non-injury to cans and contents, exceptionally satisfactory.

I do not confine myself to the precise forms, proportions and relations of parts illustrated in the drawings, my invention comprising any modifications which, by use of equivalents, attain the same results in substantially the same way.

Having now described my invention what I claim and desire to secure by Letters Patent is the following, viz:—

1. In a can-printing machine, a rotary shaft; carried by said shaft a bent resilient disk disposed, for the most part, in a plane inclined to, and having its bent portion disposed in a plane perpendicular to, the longitudinal axis of said shaft; a can-printing member; and means operatively connecting said disk with said member to oscillate it against and from a can.

2. In a can-printing machine, a rotary shaft; carried by said shaft a disk disposed for the most part obliquely and as to a segment thereof rectangularly to the longitudinal axis of said shaft; a can-printing member; and, operatively connecting said disk with said member, means which actuated by said obliquely disposed portions of said disk oscillate said member and are by the rectangularly disposed segment of said disk interrupted in so oscillating said member.

3. In a can-printing machine, a rotary shaft; carried by said shaft a disk disposed for the most part obliquely and as to a segment thereof rectangularly to the longitudinal axis of said shaft; a can-printing member; adjacent said shaft a therewith parallel longitudinally slidable rod; carried by said rod elements between which are rotatable the sides of said disk adjacent to its periphery, and means actuated by said rod to impel said can-printing member against and from a can.

4. In a can-printing machine, a rotary shaft; carried by said shaft a bent disk having a part inclined, and another part rectangular, to the longitudinal axis of said shaft; a can-printing member; and operatively connecting said disk with said member means actuated by said inclined part to oscillate said member and interrupted by said rectangular part from so oscillating it.

5. In a can-printing machine, means to hold a can having an end disposed in a predetermined position; an ink-bearing member disposed opposite said end; intermediate said end and said ink-bearing member an oscillatable arm; rotatably carried by said arm a block; carried by said block a type; a lever carried by said block; rotatably carried by a stationary part of said machine a pin having a perforation within which is slidably disposed a portion of said lever; and means to oscillate said arm whereby said type is rotated, and impelled against said ink-bearing member and reversely against said end of said can.

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