

Nov. 15, 1938.

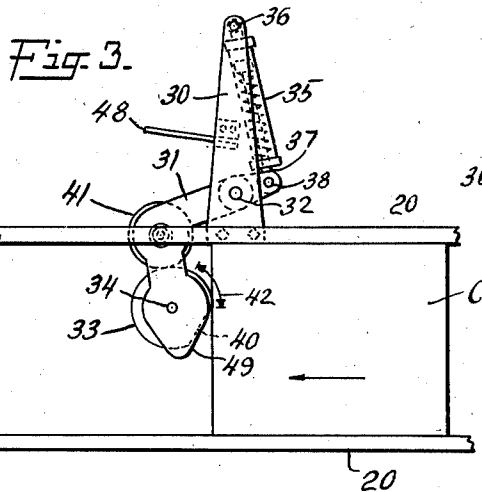
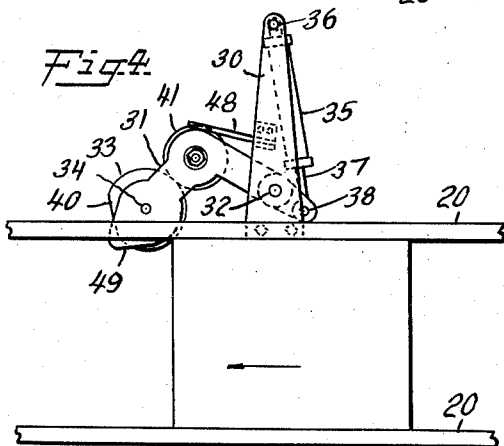
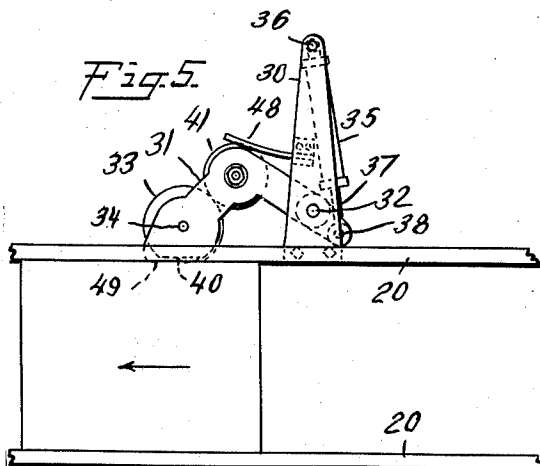
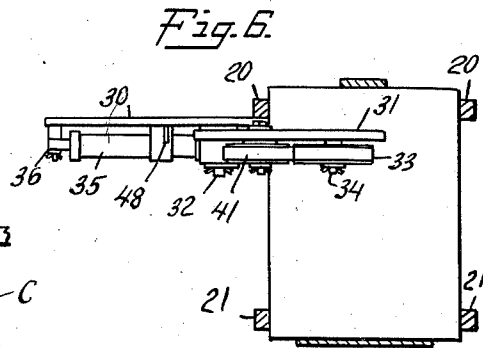
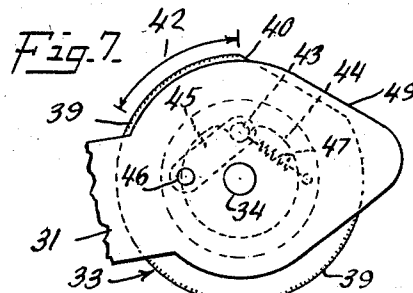
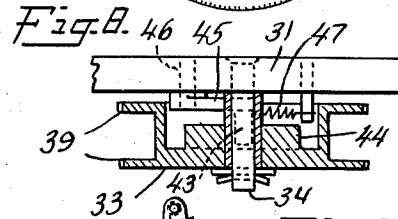
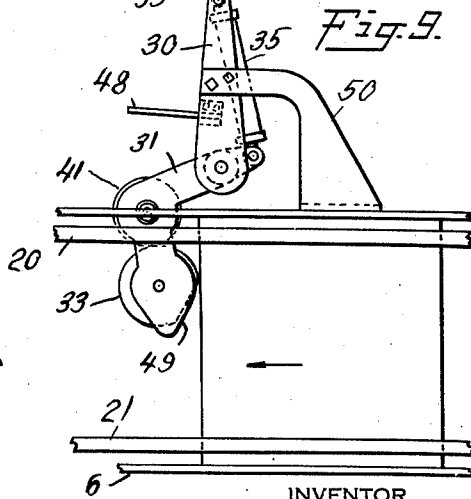
J. J. THAYER

2,136,897

CARTON PRINTING APPARATUS

Filed Feb. 27, 1937

2 Sheets-Sheet 2



INVENTOR
Josephus J. Thayer
BY
Pennie, Davis, Korman & Edwards
HIS ATTORNEYS

UNITED STATES PATENT OFFICE

2,136,897

CARTON PRINTING APPARATUS

Josephus J. Thayer, La Grange Park, Ill.

Application February 27, 1937, Serial No. 128,258

10 Claims. (Cl. 101—37)

This invention relates to a printing machine, and more especially to an improved apparatus for printing a number, name, label, or other mark, on the surface of a package, carton or other container.

In the packing of articles, such as cereal packages, soap, canned goods, etc., it is oftentimes desirable that a date, name, batch number, label, or other mark, be affixed to the outside of the package, case or carton in which the material is packed.

The present invention aims to provide a simple and inexpensive apparatus for stamping or imprinting the front, and, if desired, also the side of the carton while the carton is travelling. The object of the invention is to print especially the front end of the carton while it is being advanced by a carton handling apparatus, and, particularly, while the carton is being advanced through a gluing machine for unfolding, applying glue, and refolding the flaps of the carton, and just prior to the delivery of the carton to the pressing apparatus which holds the flaps under suitable pressure until the adhesive has partially set.

The invention will be understood from a consideration of the accompanying drawings which show, by way of example, one embodiment of the invention associated with a carton gluing machine. In these drawings:

Fig. 1 is a view in side elevation of a carton gluing machine including my improved printing machine;

Fig. 2 is a plan view of the apparatus shown in Fig. 1;

Fig. 3 is an enlarged plan view of a fragment of Fig. 2 illustrating the printing mechanism drawn to a larger scale and showing the commencement of a printing operation;

Fig. 4 is a view similar to Fig. 3 showing the movement of the printing mechanism to cause it to print on the side of the carton;

Fig. 5 is also similar to Fig. 3 showing the position of the parts at or after the completion of the printing operation on the carton side;

Fig. 6 is a view in vertical elevation of the printing mechanism of Fig. 3 with certain parts of the gluing apparatus shown in section;

Figs. 7 and 8 are detailed views of the type wheel and its mounting, Fig. 8 being a vertical section taken on the horizontal center line of Fig. 7;

Fig. 9 is a view showing a modification wherein the printing mechanism is arranged to imprint the front and top of the carton instead of the front and side; and

Fig. 10 is a perspective view showing the manner of stamping of a carton.

Referring now to these drawings, my improved printing mechanism has been illustrated in connection with a carton-handling apparatus of the type in which the cartons are advanced at uniform speed in spaced relation to one another, and this particular apparatus is also provided with a mechanism for gluing both the bottom and the top flaps of the carton simultaneously. Thus the cartons with their bottom flaps folded closed but unsealed are delivered to the machine from a roller table 1 at the right hand end of the machine, as shown in Fig. 1. Upon being delivered onto the angular roller table 2, the outer bottom flaps hinged along the sides of the carton are permitted to drop slightly on account of the inclination of the two sets of rollers 3 and 4. This permits the entry of point 5 of a metal supporting plate, or platen, 6 above the centers of the outer bottom flaps as the carton proceeds, and after the carton has advanced from position A to position B causes it to rest on its inner flaps on the table 6.

The cartons are propelled through the machine by means of a pair of endless chains 7 and pusher rods 8 which extend between these two chains. These chains pass over a pair of sprockets 9 at the left hand end of the machine and a similar pair of sprockets 10 at the right hand end. Sprockets 9 are keyed to a shaft 11 which is continuously driven by means of an electric motor 12 and suitable connecting gearing.

As the carton is carried forward toward the left from the position B, the bottom flaps are unfolded by means of pairs of warped surface members 13, and the top flaps by similar unfolders 14. These devices turn the flaps outwardly to the horizontal position and deliver them into contact with lower glue-applying rollers 15 and upper glue-applying rollers 16, one of each of these rollers being positioned on each side of the machine. The cartons continue their advance and their flaps are refolded and closed by means of refolder members 17 and 18, and thereafter the cartons are delivered to a succeeding operation which usually consists in subjecting the flaps to suitable pressure for a sufficient length of time for the adhesive to set so that the cartons can be handled. The lower belt of the pressing apparatus, or compression unit, is indicated by reference numeral 19, the upper belt not being illustrated.

As the cartons advance through the machine,

just described, they are guided by means of two pairs of guide bars engaging the opposite sides of the cartons near the top and near the bottom, respectively. The upper guide bars are indicated by reference numeral 20, and the lower guide bars by numeral 21. This machine is capable of adjustment to handle cartons of different widths and different heights. For this purpose, the inclined rollers 3 and 4 may be adjusted with respect to one another, together with the guide bars just referred to, the unfolders 14, the glue rollers 15 and 16 and the refolders 17 and 18. For this purpose the upper guide bars 20, the upper unfolders 14, glue roller 16 and refolders 18 are carried upon a supporting framework 22 which is supported upon four uprights 23, upon which this framework may be held at any desired elevation by means of set screws 24.

In order to provide for the horizontal adjustment of the guide bars and flap-manipulating and gluing devices, framework 22 has a pair of horizontal bars 25 which extend crosswise of the machine. By loosening set screws 26, the guide bars 7, together with unfolders 14, glue roller 16 and refolders 18 on one side of the machine may be simultaneously adjusted. The same parts on the opposite side of the machine may be simultaneously adjusted in like manner by loosening set screws 27. The "jack knife" driving chains 28 and 29 provide for the driving of the upper glue roll from the lower part of the machine at all positions of vertical adjustment.

The carbon printing device of my present invention, which is shown in detail in Figs. 3 to 9, inclusive, comprises a frame member 30 which consists of a flat elongated triangular shaped steel plate, and is secured by means of a pair of bolts to one of the upper guide bars 20 near the discharge end of the machine as shown in Fig. 2. This plate-like frame member 30 has an L-shaped arm 31 pivoted to it at 32. At the outer end of L-shaped arm 31 there is a type receiving wheel 33. This type wheel is mounted for controlled rotation on a pin 34. Arm 31 is biased to and normally held in the position shown in Fig. 3 so that the type wheel 33 is in the path of the carton as it reaches position C (Fig. 1), by means of a spring shown within the dash pot cylinder 35. The outer end of this cylinder is pivoted at 36 to the outer end of frame member 30, while the piston rod 37 is pivoted to an extension 38 of L-shaped arm 31.

Type receiving wheel 33 is provided with a pair of flanges 39, shown particularly in Fig. 8, and the edges of these flanges are knurled to insure rotation of the type wheel by frictional engagement with the surface of the carton. This knurling may be seen in Fig. 7. The edges of flanges 39 are slabbled or discontinued at 40 for a purpose which will appear later. The type (not shown) is preferably formed upon the surface of rubber blocks of an appropriate size to be firmly held by friction between the walls of flanges 39. The type is inked by means of a felt inking roller 41 which is adjustably mounted upon the L-shaped arm 31.

If it is desired to print only upon the front face of the carton, for example, the number 1254 as indicated in Fig. 10, type corresponding to this number is inserted in type wheel 33 in approximately the arc indicated at 42. Should it, however, also be desired to print an additional number, for example, the date number 37219 on the side of the carton as shown in Fig. 10, the type for this number is also inserted in type wheel

33. The last digit of this number, namely, the numeral 9 is spaced somewhat from the first digit, namely No. 1 of the number 1254.

When, now, the carton arrives at position C in its advance, it engages the knurled flanges 39 of the type wheel adjacent one end of the slabbled portion 40, the type wheel being held in this position by means of a latch pin 43 (Fig. 7) which engages a notch in a disc 44, the latch pin being fixed to the end of a latch lever 45 pivoted at 46 to L-shaped lever 31, and disc 44 being fixed within the hollow center of type wheel 33. The latch is biased by means of a helical spring 47.

As the carton continues its advance from position C, the frictional engagement with the flanges of the type wheel causes this wheel to commence rotation, and at the same time causes the wheel to swing bodily with the L-shaped lever 31 toward the position shown in Fig. 4. At the time of contact with the type wheel, or shortly after its rotation commences, the printing of the number 1254 on the front end of the carton commences, digit 4 being the first digit to be printed. This printing operation continues as the wheel 33 rotates over the surface of the front end of the carton, and is preferably completed before the wheel has reached the corner of the carton in order that this number may be spaced somewhat from the side of the carton.

As the L-shaped arm 31 reaches the position shown in Fig. 4, it engages the yieldable stop 48 which prevents the further swinging of the arm and also of the dash pot 35. The continued movement of the carton causes the wheel 33 to roll around the corner of the carton and then along the side of the carton, and during this movement, the digits comprising the number 37219 are printed upon the side of the carton. These digits can be positioned within the flanges 39 so as to cause them to appear at any desired position with respect to the corner of the carton. As soon as the printing of this number is finished, the slabbled portion 40 of printing wheel 33 reaches a position adjacent the surface of the carton. This causes the rotation of the printing wheel 33 to cease, and at the same time the pressure of L-shaped arm 31 against the side of the carton is taken by means of a guard surface 49 on arm 31 which projects outwardly beyond the slabbled portion 40. This condition of affairs is illustrated in Fig. 5, and continues until the rear end of the carton has passed beyond the guard surface 49, at which time, L-shaped arm 31 is released and returned to its original position as shown in Fig. 3 under the control of dash pot 35. At the time that the slabbled portion 40 reaches the position shown in Fig. 5 where the rotation of the printing wheel is discontinued, a latch pin 43 drops into the notch in disc 44. This locks the printing wheel against backward rotation at the commencement of the next printing operation, as the latch pin and notch are so arranged as to permit rotation in the forward but not in the backward direction.

In Fig. 9, a modification is illustrated wherein the printing mechanism is arranged above instead of at the side of the carton in order that the printing may be done upon the front end and the top of the carton instead of upon the front end and side of the carton. For this purpose, it is only necessary to attach the plate-like frame 30 to a bracket 50 which is appropriately carried by means of frame member 22.

By means of the mechanism of my present invention, I provide a printing device which is

simple in construction and operation. It requires few parts which may be readily made of rugged nature, and consequently the apparatus is not liable to get out of adjustment or to give trouble in operation. The printing of one number or mark on the front of the carton is always done in approximately the same position, and likewise with the number on the side of the carton when it is desired to print on the side as well as on the front. Printing upon the front end of moving cartons has been a problem which has occupied the attention of a number of workers in this art, and in so far as I am aware has not been heretofore accomplished successfully.

As indicated above, the cycle of printing may include either the printing upon the front end or the side of the carton or both. It may include the making of one or more different impressions, or the same impression on one or more different positions on the carton.

It will be understood that in the appended claims which are intended to set forth the scope of my invention, which has been described above in a typical embodiment, the term "carton" includes a case or package upon which it is desired to place an identifying mark.

I claim:

1. In a machine for printing upon the front face and an adjoining face of articles having angularly disposed faces as they advance through the machine, means for advancing the articles through the machine, a rotatable type wheel, means for pivotally supporting said wheel, yielding means for normally urging said wheel to a position in the path of articles advancing through the machine, whereby said wheel will be engaged and rotated by frictional contact with the front face of the advancing articles and moved to a position outside the path of the articles, the effective force of said yielding means on said wheel support continuing during such movement of the wheel to a position outside the path of the articles and after the wheel has been moved from the path of the articles and then forcing said wheel into frictional contact with a face adjoining the front face of each of said articles, whereby printing on the front and an adjoining face of articles passing through the machine is accomplished.

2. In a machine of the character described, means for advancing cartons, a rotatable type wheel, means for pivotally supporting said wheel, yielding means for normally urging said wheel to a position in the path of cartons advancing through the machine, whereby said wheel will be engaged and rotated by frictional contact with the front of advancing cartons and moved to a position outside the path of the cartons, the effective force of said yielding means on said wheel support continuing during such movement of the wheel to a position outside the path of the cartons and after the wheel has been moved from the path of the cartons and then forcing said wheel into frictional contact with another side of each carton, whereby printing on the front and another side of cartons passing through the machine is accomplished, and means for interrupting the frictional contact of said wheel with said other side of each carton after a printing operation has been performed on said other side of each carton.

3. In a machine for receiving and advancing cartons including means for unfolding, gluing and re-folding the flaps of the cartons during the advance thereof; a rotatable type wheel, means for pivotally supporting said wheel, yield-

ing means for normally urging said wheel to a position in the path of cartons advancing through the machine, whereby said wheel will be engaged and rotated by frictional contact with the front of advancing cartons and moved to a position outside the path of the cartons, the effective force of said yielding means on said wheel support continuing during such movement of the wheel to a position outside the path of the cartons and after the wheel has been moved from the path of the cartons and then forcing said wheel into frictional contact with another side of each carton, whereby printing on the front and another side of cartons passing through the machine is accomplished.

4. In a machine of the character described, means for advancing cartons, a rotatable type wheel having a part of the surface thereof flatter than the printing surface, means for pivotally supporting said wheel, yielding means for normally urging said wheel to a position in the path of cartons advancing through the machine, whereby said wheel will be engaged and rotated by frictional contact with the front of advancing cartons and moved to a position outside the path of the cartons, the effective force of said yielding means on said wheel support continuing during such movement of the wheel to a position outside the path of the cartons and after the wheel has been moved from the path of the cartons and then forcing said wheel into frictional contact with another side of each carton, whereby printing on the front and another side of cartons passing through the machine is accomplished, and means for discontinuing the rotation of said wheel when the flatter portion thereof reaches a position opposite said other side of each carton.

5. In a machine of the character described, means for advancing cartons, a type wheel rotatable in one direction but held against rotation in the opposite direction, means for pivotally supporting said wheel, yielding means for normally urging said wheel to a position in the path of cartons advancing through the machine, whereby said wheel will be engaged and rotated by frictional contact with the front of advancing cartons and moved to a position outside the path of the cartons, the effective force of said yielding means on said wheel support continuing during such movement of the wheel to a position outside the path of the cartons and after the wheel has been moved from the path of the cartons and then forcing said wheel into frictional contact with another side of each carton, whereby printing on the front and another side of cartons passing through the machine is accomplished.

6. In a machine of the character described, means for advancing cartons, a rotatable type wheel, a disc movable with said type wheel and having a notch in the periphery thereof, a latch pin engageable in said notch and adapted to prevent rotation of said type wheel in one direction, means for pivotally supporting said wheel, yielding means for normally urging said wheel to a position in the path of cartons advancing through the machine, whereby said wheel will be engaged and rotated by frictional contact with the front of advancing cartons and moved to a position outside the path of the cartons, the effective force of said yielding means on said wheel support continuing during such movement of the wheel to a position outside the path of the cartons and after the wheel has been moved from the path of the cartons and then forcing said wheel into frictional contact with another side of each carton, whereby printing on the front and an-

other side of cartons passing through the machine is accomplished.

7. In a machine of the character described, means for advancing cartons, guide bars for cartons passing through the machine, a rotatable type wheel, a support for said type wheel pivotally supported by said guide bars, said type wheel being carried by said support at one side of the pivot, an extension of said support extending beyond the other side of said pivot, yielding means acting upon said extension of the support for normally urging said wheel to a position in the path of cartons advancing through the machine, whereby said wheel will be engaged and rotated by frictional contact with the front of advancing cartons and moved to a position outside the path of the cartons, the effective force of said yielding means on said wheel support continuing during such movement of the wheel to a position outside the path of the cartons and after the wheel has been moved from the path of the cartons and then forcing said wheel into frictional contact with another side of each carton, whereby printing on the front and another side of cartons passing through the machine is accomplished.
8. In a machine of the character described, means for advancing cartons, a rotatable type wheel, a disc movable with said type wheel and having a notch in the periphery thereof, a latch pin engageable in said notch and adapted to prevent rotation of said type wheel in one direction, means for pivotally supporting said wheel, yielding means for normally urging said wheel to a position in the path of cartons advancing through the machine, whereby said wheel will be engaged and rotated by frictional contact with the front of advancing cartons and moved to a position outside the path of the cartons, a dashpot for preventing abrupt movement of said wheel support under the action of said yielding means, the effective

force of said yielding means on said wheel support continuing during such movement of the wheel to a position outside the path of the cartons and after the wheel has been moved from the path of the cartons and then forcing said wheel into frictional contact with another side of each carton, whereby printing on the front and another side of cartons passing through the machine is accomplished.

9. In a machine of the class described, a rotatable type member having a part of the surface thereof flatter than the printing surface, means for pivotally supporting said rotatable type member means for advancing articles past said type member, means for yieldingly urging said type member into frictional contact with articles as they pass said member and thereby rotated by said articles to print thereon, and means for discontinuing rotation of said type member when the flatter surface thereof reaches a position opposite the articles.

10. In a machine of the class described, a rotatable type member having an arcuate surface and a surface which is flatter than the type surface, means for advancing articles past said type member, means for causing said type member to be brought into frictional contact with articles as they pass said type member and thereby rotated by said articles to print thereon, means for discontinuing rotation of said type member when the flatter portion thereof reaches a position opposite the articles, and a guard member at one side of said type member, said guard member extending beyond the flatter surface of the type member when said flatter surface is opposite articles passing said type member and bearing upon said articles to maintain said type member out of contact with the articles.

JOSEPHUS J. THAYER. 40