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 [21] Appl. No. **735,800**
 [22] Filed **June 10, 1968**
 [45] Patented **Aug. 17, 1971**

[54] **SEALED PRINTING MECHANISM USING HIGHLY VOLATILE INKS**
6 Claims, 4 Drawing Figs.

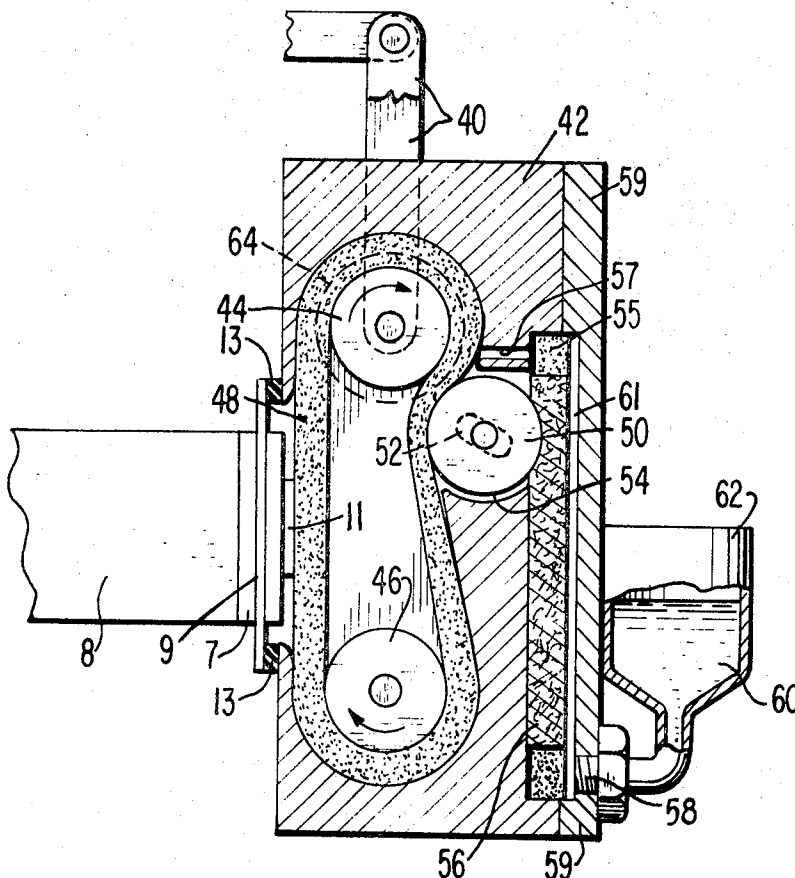
[52] U.S. Cl. **101/333,**
101/364
 [51] Int. Cl. **B41k 1/42**
 [50] Field of Search **101/333,**
334, 103—105, 364, 360, 363, 108, 81, 82, 350;
197/168

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ABSTRACT: A printing attachment in which a sealed housing containing an ink carrier is supplied with all types of inks including highly volatile inks. An opening in the housing exposes a portion of the ink carrier for purposes of periodically transferring ink from the carrier by means of a printing member to a printing surface, and the printing member is provided with a sealing means for closing the opening in the housing when contacting the ink carrier.



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FIG. 1

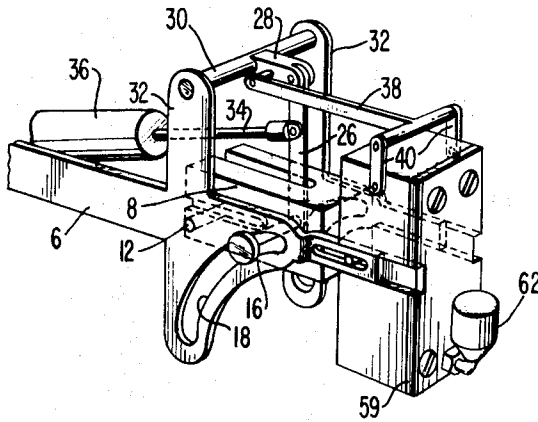


FIG. 3

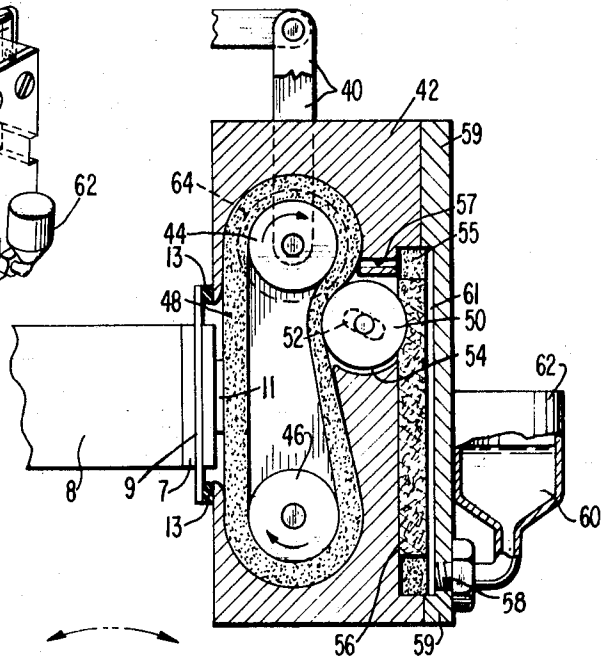


FIG. 2

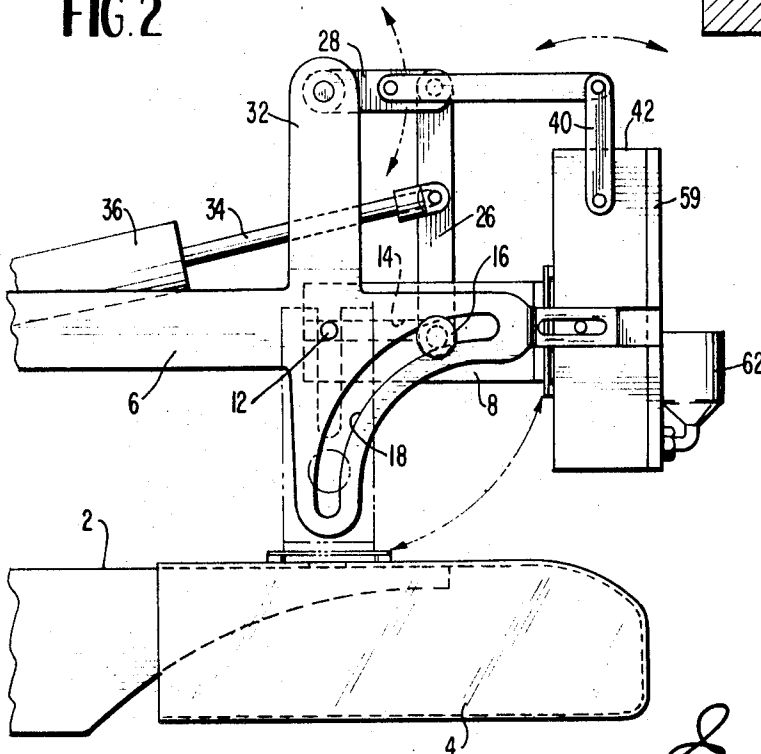
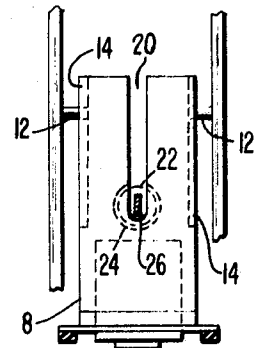


FIG. 1a



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SEALED PRINTING MECHANISM USING HIGHLY VOLATILE INKS

This invention relates to price-printing devices and, more particularly, to a price-printing attachment of the type provided with changeable indicia using a highly volatile ink and adapted to be employed with packaging machinery.

The packaging of articles, especially foods, is consistently gaining more attention with the result that packaging machinery is becoming more sophisticated as the demands for speed and efficiency become manifest. In a machine of this type, it is highly desirable to combine the wrapping operation of the article with the price-marking operation, and in such machines which operate at high speed, it is necessary to provide a printing device which will combine the features of speed, efficiency and reliability.

A printing device according to the present invention can utilize all types of ink including nontoxic inks as well as highly volatile inks and such a device may be used for any kind of printing operation wherein a moving surface or different surfaces sequentially presented are adapted to be printed upon. By way of illustration but not being limited thereto, the printing device according to the invention is described for use with a food wrapping or packaging machine.

Accordingly, it is an object of this invention to provide an indicia printing device of simple construction which operates automatically in synchronization with an associated package-wrapping machine.

Another object of this invention is to provide an improved indicia printing device for attachment to a packaging and wrapping machine requiring only a single power stroke operation.

It is yet another object of this invention to provide an improved indicia printing device for attachment with a package-wrapping machine which is power-actuated and operates in a definite and positive cycle such that an automatic printing operation is effected for each wrapping operation of the packaging machine.

It is still a further object of this invention to provide a completely sealed device utilizing a highly volatile ink in repeated operations with an indicia printing member without unnecessary loss of ink due to evaporation.

It is yet a further object of this invention to provide a sealed device which utilizes a highly volatile ink in a continuous, automatic operation with a printing mechanism in which the ink is maintained in a liquid state to thereby prevent clogging of the moving parts associated with the device.

In accordance with one embodiment utilizing the principles of this invention, there is provided a unitary sealed housing having a rotatably mounted endless belt of spongelike material which is supplied with a printing ink in order to transfer the same to a power-operated linkage carrying an indicia-bearing printing member. For each wrapping operation of the packaging machine, the printing member will engage the ink-bearing belt and then swing to a position for printing indicia on the wrapping material.

Other objects and advantages will become readily apparent from a following study of the specification and drawings in which:

FIG. 1 is a perspective view showing the printing device constructed according to this invention;

FIG. 1a is a partial plan, partial cross section of the apparatus shown in FIG. 1;

FIG. 2 is a side elevational view of the device shown in FIG. 1; and

FIG. 3 is an enlarged cross section of the housing for the ink-transferring apparatus. Referring now to FIGS. 1 and 2, there is shown that portion of a packaging machine in which a scoop member 2 is inserted into an inflated bag 4, the latter being held taut and in an opened condition by the scoop member to receive an article, for example, a loaf of bread or some such other article or the like. The details of this type of wrapping machine may be found in applicant's U.S. Letters

Pat. No. 3,358,414. It is to be understood that the wrapping machine per se forms no part of the present invention and, consequently, it is only necessary to provide a suitable wrapping material and an underlying platen upon which the printing operation can take place.

Positioned above the scoop or platen member 2 are a pair of generally T-shaped bracket members 6 for supporting a yoke member 8 having a magnetic plate 7 mounted on its front face. As best shown in FIG. 3, a steel printing plate 9 or other ferrite member is supported by the magnetic plate; the former has affixed thereto the type face 11. Along the edges of the steel plate 9 are seal members 13 which, as shown, contact the sealed housing to be described below. At the crux of each of the brackets 6 there extends at right angles therefrom a pin 12 upon which is supported for slidable and pivotal movement the yoke member 8. For this purpose, the yoke member is provided on each side thereof with a lateral recess or slot 14 for receiving the pin member 12 as shown. Near the forward end of the yoke member 8 and on opposing sides thereof and coaxial with the slots 14 there extends at right angles a pair of stud or pin members 16 which slidably fit into respective arcuate slots 18 on the brackets 6, as shown.

As best shown in FIG. 1a, the yoke member 8 is further provided with a rear slot 20 which is cut at right angles to the side slots 14. At the base of the slot 20 there is provided a spherical recess portion 22 for rotatably receiving a ball joint 24 of a linkage arm 26. The ball joint and recess connection can, however, be replaced with a suitable pin and slot connection, or the like. The arrangement, as shown, however, is considered to be the most practical and simple. The other end of linkage arm 26 is pivotally connected by suitable means to a link member 28 which is secured to a rod 30 which is rotatably supported by each of the upstanding members 32 of brackets 6. Intermediate the two ends of linkage arm 26 there is pivotally connected an actuating arm 34 of a power unit which may be an air cylinder or the like. Pivotal connection to the linkage member 28, intermediate its ends, is one end of a T-shaped linkage member 38 having its crossbar pivotally connected at each of its ends to the ends of the arms 40. The other ends of arms 40 are rotatably mounted to the housing 8, to be more fully explained below.

The ink feeding station or housing is best shown in FIG. 3. A main housing 42 of generally hollow configuration rotatably supports, by suitable bearings, two roller members 44, 46 as shown. These roller members are Teflon-coated and the bearings for supporting the same are suitably sealed in U-cup packings, not shown, so as to provide an efficient seal between the bearings for supporting the rods on which the rollers are mounted and the housing in which the bearings are mounted. An endless belt 48 of sponge rubber or other suitable elastic material is fitted around the rollers 44, 46. A portion of the belt 48 between the rollers is exposed through an opening in the housing 42 and, as shown, the printing plate 9 with its type face 11 presses against the belt in the loading operation. Adjacent the top roller 44 there is an additional pressure roller 50 which acts to pressure the belt against the top roller 44. The pressure roller 50 is mounted in the same manner as rollers 44, 46 and may be positioned such that its periphery is a fixed distance from the periphery of the roller 44. The roller 50, however, may be adjustably mounted by the provision of suitable slots and screw means 52 on opposing side faces of the housing 42 so as to vary the distance between the top roller and itself for reasons to be explained below. Again, U-cupped packings must be fitted to the slots 52 to fulfill the sealing requirement above discussed. As in the case of rollers 44, 46, roller 50 is Teflon-coated so as to offer a chemically nonreactive surface to the types of ink used with this invention. The roller 50, as shown, occupies a recess 54 which opens into a further recess 55 filled with a hard felt material 56. Near the bottom of the housing there is an inlet port 58 communicating with the recess 55 and a supply of ink 60 in a suitable container 62. As shown in FIG. 3, the felt pad 56 has a cutout portion at each of its ends. This arrangement leaves a space in the

top and bottom portions of the recess 55. The top portion will be seen as having a port 57 communicating with the interior of the housing 42. The space provided at the bottom communicates with the inlet port 58 which, in turn, communicates with the ink supply. A cover plate 59 having a recess portion corresponding to the recess 55 in the housing 42, is adapted to fit against the housing 42 and hence over the pad 56 in a seal-type engagement. For this purpose a suitable Teflon gasket may be inserted between the cover plate 59 and the housing 42. The cover plate 59 is further provided with a longitudinally extending channel 61 which, when the cover plate is in place, will communicate with the spaced area in the upper portion of the recess 55 and the space in the lower portion of the recess 55. This arrangement will allow air pressure relief between the interior of the housing 42 and the ink supply container 62, thus ensuring an unobstructed flow of ink from the container 62 to the felt pad 56.

An internal overrunning clutch 64, located inside the roller 44 and connected between two separate supports within the roller 44, operates the same to rotate it in a given direction as shown by the arrows in FIG. 2. The clutch 64 need not be contained within the roller 44 but may be positioned on the outside of the housing 42 thus connecting one of the arms 40 to an extension of the shaft support for the roller 44. The ink 60 from the container 62 is fed to the belt 48 by means of the roller 50 which contacts the ink-soaked felt member 56 and transmits the ink therefrom onto the belt. By adjusting the position of the roller 50 with respect to the upper roller 44, the belt may be squeezed to varying thicknesses, thus regulating the amount of ink residual in the belt.

The operation of the invention is as follows: The power unit 36 associated with the wrapping machine is controlled by the position of the platen 2 as well as the bracket 6 which may be supported by suitable linkage associated with the wrapping machine. The operating details of the latter need not be described and for the present purpose it is only necessary to describe the complete cycle of operation of the printer which is essentially two steps, the first being an ink-applying operation to the printing plate on the yoke member, and the second being the imprinting operation on the wrapping material or bag 4. As shown in solid lines, the yoke member 8 bears its printing plate against the belt 48 with the sealing members 13 engaging the housing 42 and surrounding the opening therein. Upon energization of the power unit 36, the actuating rod 34 is pulled rearwardly bringing with it the linkage arm 26 in a lateral and downward motion. By virtue of the pivotal connection 22, 24 between the linkage arm 26 and the yoke 8, the latter is caused to follow the arcuate slot by means of the pin members 16, and due to the lost motion connection between the slots 18 and the pins 16, the yoke member 8 essentially slides backward, upward and then downward into the dotted line position, as shown, bringing the printing plate in contact with the bag 4. Simultaneously with the movement of the yoke member to its operative position, the linkage 28, during its downward stroke as a result of the rearward pull of the actuating rod, brings with it the T-shaped linkage member 38 which rotates the arms 40 in a counterclockwise direction. This latter movement, however, will not be imparted to the roller 44 by virtue of the action of the overrunning clutch 64 contained within the roller 44. When the power unit is reversed, in accordance with suitable timing mechanisms associated with the wrapping machine, the actuating rod 34 during its forward stroke causes the yoke member 8 to return to its original position in the reverse of the manner above-described. At the same time the arms 40 will be rotated in a clockwise direction causing the roller 44 to rotate within the housing and thus stepping the belt 48 past the opening in the housing 42 for the next printing operation. The clutch arrangement accounts for a ratchet action on the roller 44 which, for each cycle of operation, steps the belt 48 past the opening in the housing 42, thereby presenting a newly inked area on the belt for the printing plate to engage.

It will be seen that the housing 42 operates as a completely sealed device in which a volatile fluid such as a high alcoholic content ink is maintained in a liquid condition without the fear of clogging. When the printing plate is in the position shown in FIG. 3, it will also be seen that the sealing member 13 in effect closes the opening by which the belt 48 is exposed. Thus, when the wrapping machine is in an inoperative condition, the yoke member 8 is in the position shown in FIG. 3 ensuring, therefore, that the housing 42 is completely sealed thus avoiding the necessity of removing the ink from the housing should the device remain inoperative for a long period of time. The only time when the housing 42 is vented or opened to atmosphere is when the yoke 8 is removed from the opening thus exposing the belt 48, and this condition exists only during the last part or second step of the cyclic operation, that is, when an imprint is being made upon the package, as shown in FIG. 2 in dotted lines. At this same time, any pressure buildup within the ink receptacle 62 will be relieved through the channel 61 to the interior of the housing by way of port 57, past the belt 48 and through the opening in the housing 42.

Although several embodiments of the invention have been depicted and described, it will be apparent that these embodiments are illustrative in nature and that a number of modifications in the apparatus and variations in its end use may be effected without departing from the spirit or scope of the invention as defined in the appended claims.

I claim:

1. In a printing attachment, the combination comprising: a support member, a yoke member having a printing means thereon pivotally supported on said support member, said printing means having a sealing means thereon, a housing having an opening and at least one roller means supported therein, an endless belt supported entirely within said housing on said roller means and having a portion thereof arranged to cover said opening, means supplying ink to said belt, said printing means engaging said belt exposed to said opening and said sealing means engaging said housing and surrounding said opening for a given position of said yoke member, and actuating means connected to said yoke member and said roller means for moving said yoke member and rotating said roller means.

2. In a printing attachment, the combination comprising: a housing having an interior wall and including a window therein, belt means supported entirely in said housing and arranged to traverse about at least one roller means, said belt having a surface portion thereof arranged to traverse in contact with the portions of said interior wall adjacent said window to cover the window and thereby seal said housing, means communicating with the interior of said housing for supplying ink to said belt, pressure means interposed between said last-named means and said belt means and over which said belt traverses before it passes said window, said pressure means arranged to control the residual ink in said belt means, a clutch means connected to said roller means, and means for driving the latter to rotate said roller means and move said belt past said window.

3. In a printing attachment as claimed in claim 2 wherein said pressure means includes a roller means.

4. In a printing attachment as claimed in claim 2 wherein said pressure means urges said belt means towards said one roller means.

5. In a printing attachment as claimed in claim 2 wherein the pressure means squeezes said belt means.

6. In a printing attachment, the combination comprising: a housing having an interior wall and including a window therein, belt means supported entirely in said housing and arranged to traverse about at least one roller means, said belt having a surface portion thereof arranged to traverse in contact with the portions of said interior wall adjacent said window to cover the window and thereby seal said housing, means communicating with the interior of said housing for supplying ink to said belt, a clutch means connected to said roller means, and means for driving the latter to rotate said roller means and

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move said belt past said window, and indicia carrying means mounted for movement between a first position in which indicia carried thereby contacts said belt through said window and a printing position, said indicia carrying means being pro-

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vided with sealing means to contact the exterior of said housing adjacent said window when said indicia-carrying means are in said first position to prevent evaporation of ink from said belt.

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