United States Patent

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[54] **IMPRINTER APPARATUS FOR USE ON PACKAGING MACHINES OR THE LIKE**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.**.....**101/27,** 101/316

[51] **Int. Cl.**.....**B44b 5/00**

[58] **Field of Search**.....101/27, 316, 318, 198

[56] **References Cited**

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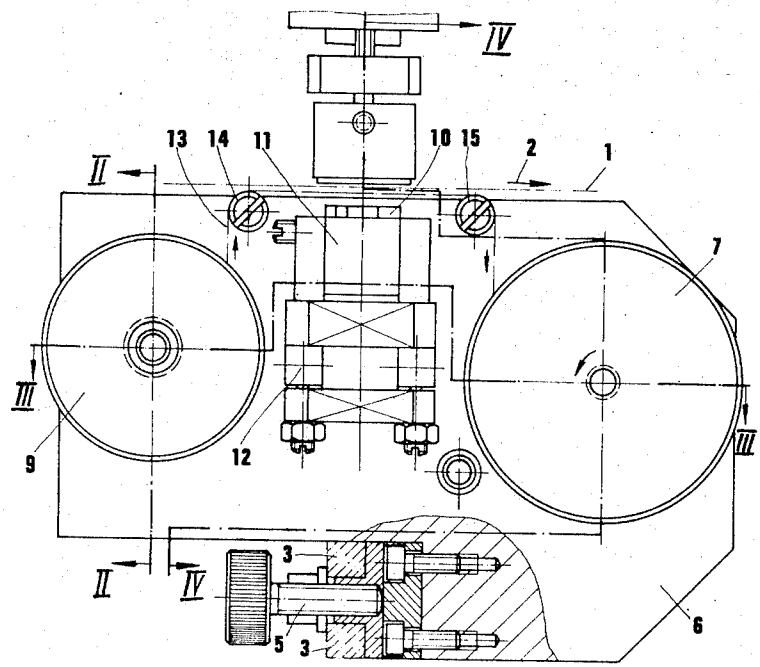
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[57] **ABSTRACT**

An imprinter apparatus used in timed relation on a packaging machine in which narrow modular units occupy a minimum of transverse space above and below a moving web upon which an imprintment is peridoically effected; a lower modular component including a single, thin vertically disposed carrier plate having components on opposite sides whereby the module occupies a minimum amount of transverse space; the components including supply and take-up reel having a ribbon with a transferable medium thereon; guide means for the ribbon; power means for moving the reels and ribbon in step-by-step relation; a printing member cooperating with the printing member on the other module; heater means for one of the printing members; and power means for operating the printing members; the power means for the respective components being fluid-pressure operated.

7 Claims, 5 Drawing Figures



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SHEET 1 OF 4

FIG.1

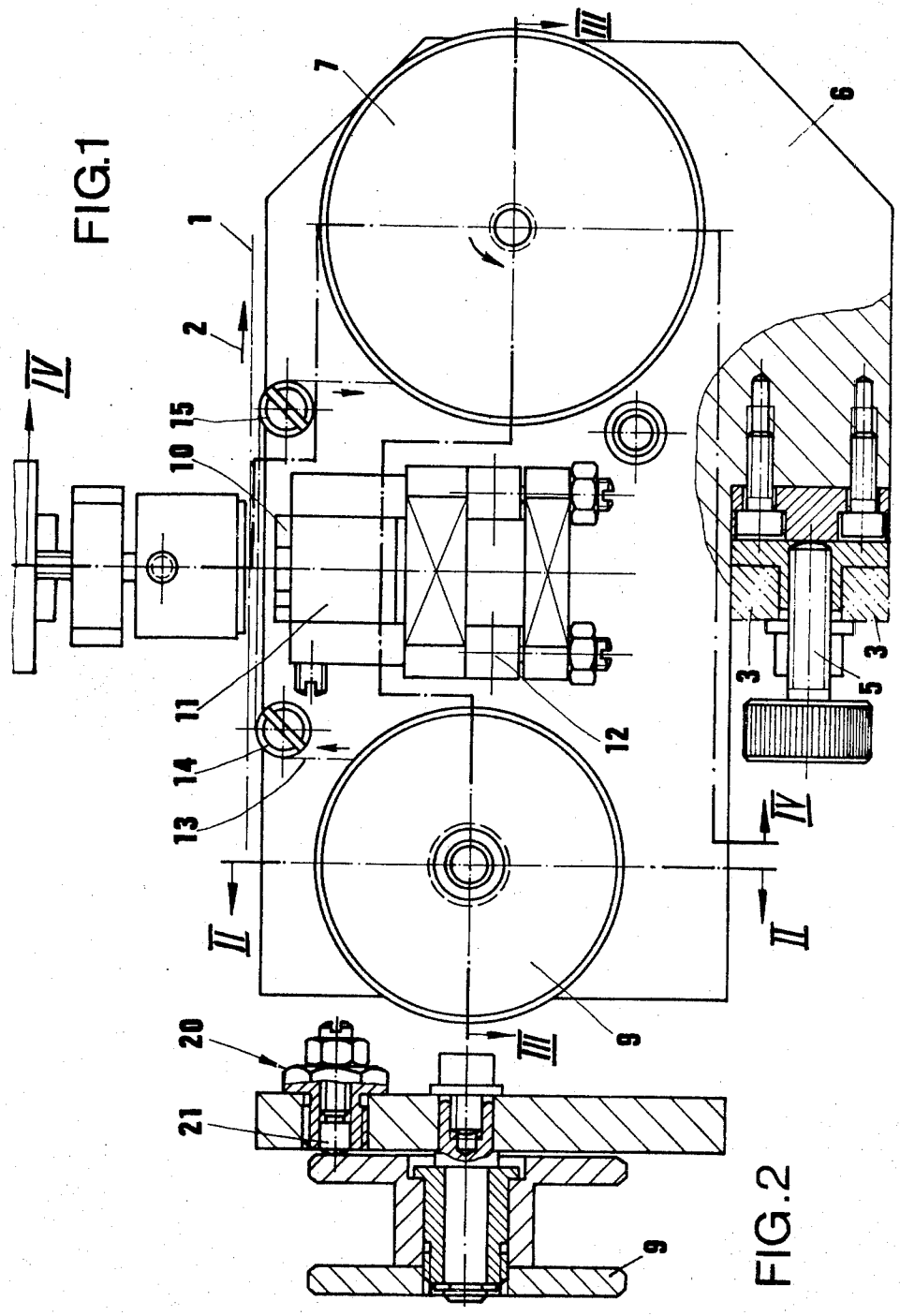
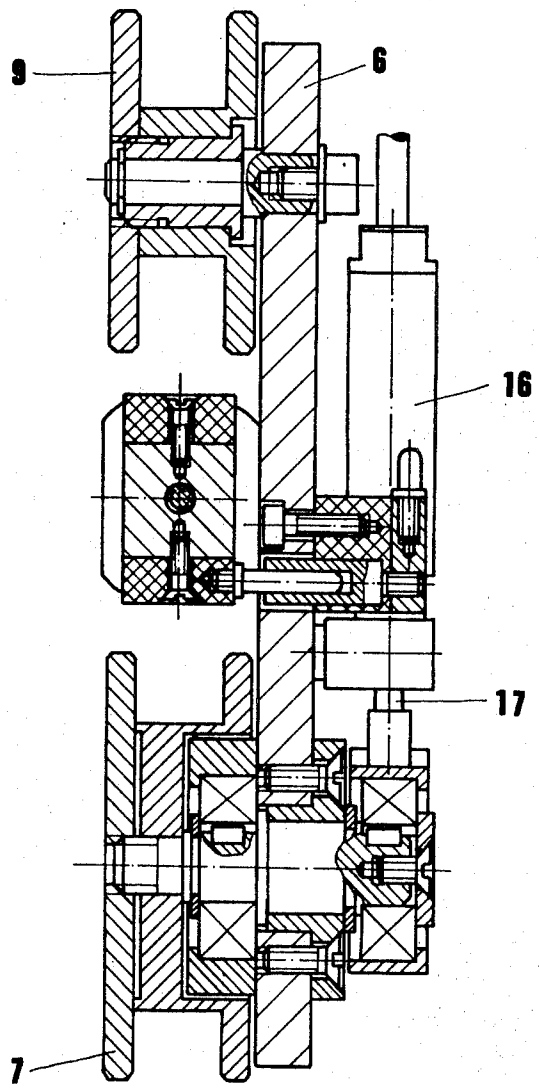


FIG.2

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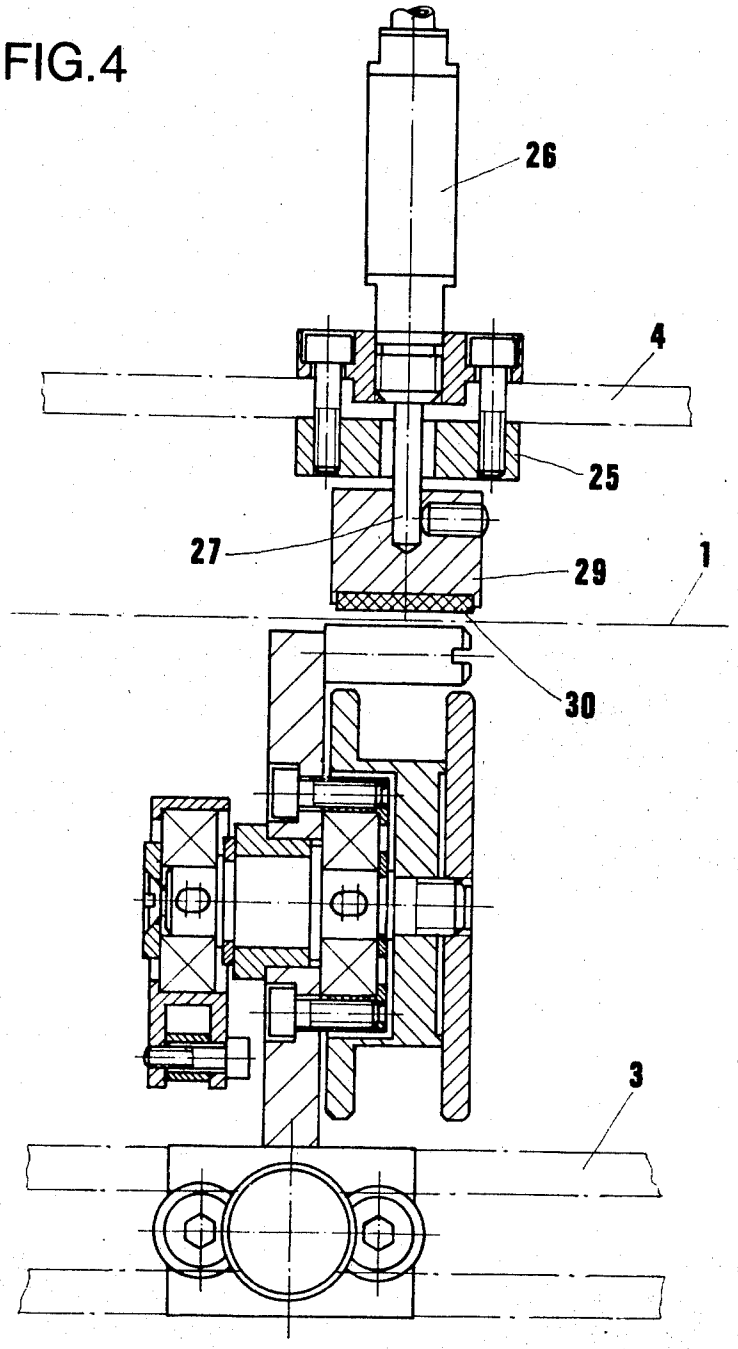
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FIG.3



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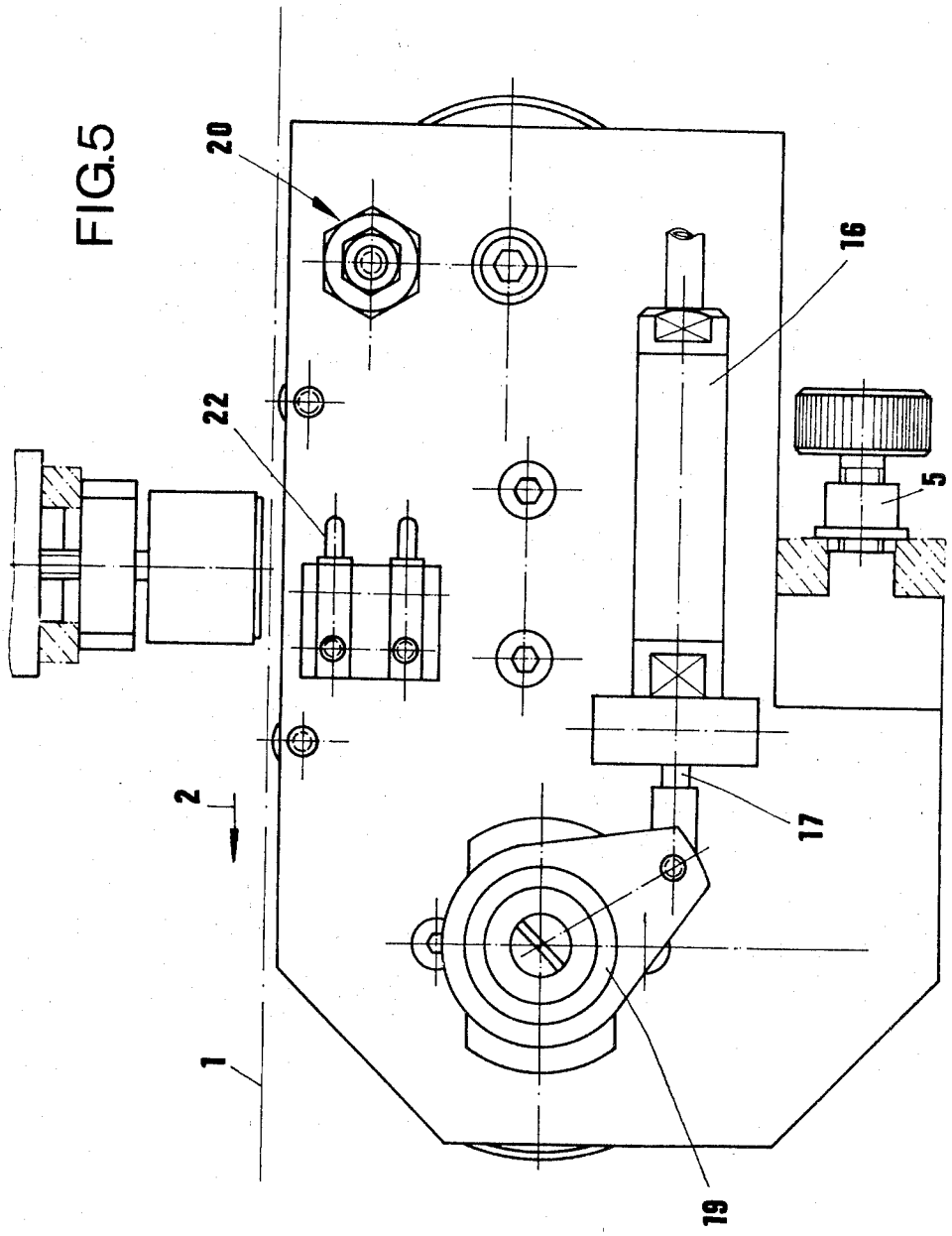
FIG.4



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FIG.5



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IMPRINTER APPARATUS FOR USE ON PACKAGING MACHINES OR THE LIKE

As a rule, printing devices of this type are disconnectibly connected with a packing machine and operate in the working rhythm of the packing machine. They are designed to stamp the packing date for example on the bag of bag foil, or to stamp further details of a similar nature. Printing devices designed for this purpose generally consist of a pair of reels with guide facilities for an ink ribbon, as well as an exchangeable printing stamp and a support for the printing stamp. A feed device produces the relative movement of the support to the printing stamp. If the ink ribbon is designed as an ink foil which only releases the ink under the effect of heat, the printing stamp is equipped with a heating feature.

In actual fact, the known printing devices work perfectly well, but they have relatively large outer dimensions. If a large number of narrow packets are manufactured adjacent to one another on a packing machine, considerably difficulties arise owing to the great width of the printing devices. The width of the printing devices must on no account exceed the width of the ready-made packets if the printing devices are to be placed adjacent to one another for the purpose of multi-row operation. A staggered arrangement is hardly possible, that is if at all possible, and it leads to a considerable increase in the space requirements.

However, the difficulties arising from the relatively large space requirements are not the only ones caused by the known printing devices. In addition, it is complicated to adapt such devices to varying conditions.

Here, it should be noted that modern packing machines are frequently converted to cope with other types of packing vessel or packing bag and that it is therefore necessary to keep the preparation time down to a minimum during the conversion.

The object of the invention is to create a packing machine with a printing device for the purpose in question, a packing machine which is characterized on the one hand by a simple design so that interference-free operation is guaranteed, and which exhibits on the other hand only relatively small outer dimensions, in particular at right-angles to the direction of feed so that the printing device can also be employed when the width of the various packets is relatively small. A further aim of the invention consists in designing the printing device in such a manner that it can be adapted rapidly and easily to various packet sizes so that the conversion of the printing device requires only little time.

The invention is based on a packing machine with a printing device for imprinting the date or similar details on a packing bag or a packing foil, a printing device which is disconnectibly connected with the packing machine and which operates in the working rhythm of the packing machine and which comprises a pair of reels and a guide facility for an ink ribbon, in particular an ink foil, an exchangeable printing stamp, a support for the printing stamp, a feed device for the relative movement of the support to the printing stamp and, where necessary, a heating feature for the printing stamp. The invention is primarily characterized by the fact that a carrier is provided which combines the pair of reels, the guide facility and the printing stamp into one building block, whereas the support with the feed device is grouped together to form a second building block which is independent of the first building block.

It has been found that in the case of the design according to the invention the width dimensions, i.e. the dimensions at right-angles to the direction of feed of the foil can be kept very small. Whereas in the known devices the attempt is made as a rule to place the feed device too in the range of the printing stamp or pair of reels, the relative movement in the printing device according to the invention is produced by moving the support. The main part of the device, i.e. the first building block, can therefore be kept so small with respect to the width dimensions that even in the manufacture of narrow packets the width of the printing device does not exceed the width of the packet.

The second building block comprises the feed device and the support, i.e. two elements which similarly require little space. The width of this second building block is therefore also small.

This makes it possible to accommodate a large number of printing devices in an identical manner adjacent to one another, a factor which in turn affords advantages with respect to the remaining design of the machine. The space requirements for the devices for printing the date or the like are low.

It is preferable to arrange the building blocks on rails on which the building blocks can be moved and fixed in position at right-angles to the direction of feed of the web of foil. Each one building block on one side of the web of foil operates in conjunction with one building block on the other side of the web of foil.

The invention prefers an embodiment in which the carrier for the first building block exhibits a plate-shaped form. Here, the plate plane is at right-angles to the plane of the web of foil and parallel to the direction of feed. The plate-shaped design of the carrier makes it easier to make checks during operation and easier to eliminate any faults or insert new ink ribbons, etc.

It is favorable if the reel pair and the guide feature for the ink ribbon are arranged on one side of the plate-shaped carrier and if the printing stamp and, where necessary, the heating feature are placed between the two reels of the reel pair. It is advisable to arrange the transport facility for the ink ribbon on the other side of the plate-shaped carrier.

It is also advisable to place the power connections for the heating feature on that side which bears the facility for transporting the ink ribbon.

The carrier can be mounted on the rail arrangement in various manners. It has been found advisable to employ a clamp-mounting.

In a preferred embodiment of the invention the transport facility for the ink ribbon consists in particular of a lifting feature actuated by compressed air, which acts on the wind-up reel of the reel pair by way of a freewheel clutch. It is advisable to provide a brake for the unwind reel of the reel pair. In a preferred embodiment of the invention it is preferable to equip the second building block with a feed facility which is actuated by compressed air and whose feed section, in particular the piston, bears the support.

The drawing shows a more detailed representation of an embodiment of the printing device in the sense of the invention. This printing device can be combined with any suitable packing machine to form a packing

machine according to the invention. The drawings shows:

FIG. 1 a side view, partly sectional, of the main parts of the printing device,

FIG. 2 a section through the dewind drum corresponding to the intersecting line II—II in FIG. 1,

FIG. 3 a horizontal section through the representation shown in FIG. 1 corresponding to the intersecting line III—III,

FIG. 4 a vertical section through the representation shown in FIG. 1 corresponding to the intersecting line IV—IV and

FIG. 5 a side view of the other side of the printing device shown in FIG. 1.

The foil which is to be printed on by the printing device is represented by dash-dot lines in the drawing and designated by the reference number 1. The direction in which the foil is transported is denoted by the arrow 2; the direction of transport thus runs in the diagram plane in the representations shown in FIGS. 1 and 5. The rail arrangements 3 for the first building block and the rail arrangements 4 for the second building block are at right-angles to this direction of movement of the foil 1. These rail arrangements 3 and 4 generally carry a large number of printing devices and the ends of the rail arrangements are supported on the packing machine chassis which is not shown in greater detail.

In principle, not only a foil can be provided with an imprint with the device according to the invention. It is also possible to print on ready-made packets. However, the print on the foil is preferred as a rule.

The plate-shaped carrier 6 is connected to the rail arrangement 3 by the clamping feature 5. On the one side of the carrier 3 (cf. FIG. 1) there are the reel pair comprising the reels 7 and 9 and the printing stamp 10 which is supported via the heating feature 11 by the rack parts 12 on the carrier 6. Here, the reel 7 is the wind-up reel, while the reel 9 is the dewind reel. The ink ribbon 13 which is designed as an ink foil is denoted by dash-dot lines in FIG. 1, but is omitted in the other representations. The ink ribbon 13 runs over the rollers 14 and 15.

The wind-up reel is subjected to the influence of a transport facility which comprises the compressed-air cylinder 16 which is arranged on the other side of the carrier 6 (cf. FIG. 3 and FIG. 5). The piston rod 17 acts on the free-wheel clutch 19 which drives the wind-up reel during the feed movement, but not during the reverse movement. As a result, the ink ribbon 13 is transported step by step when the compressed-air cylinder 16 operates and is thus drawn off the dewind reel 9.

The dewind reel 9 is subjected to the influence of a braking facility 20, with which a brake pin 21 can be pressed onto the circumference of the dewind reel 9 so that the ink ribbon always remains slightly tensioned.

The terminal 22 for the heating feature 11 is similarly arranged on the same side as the transport facility and the free-wheel clutch.

The second building block is supported by the rail arrangement 4 and is similarly connected to the rail arrangement 4 by clamping devices 25. This second building block consists in the main of the feed facility 26 which is designed as cylinder-piston arrangement which is operated by compressed air. The piston rod 27 bears the support 29 which carries the cushion 30.

The operating principle of the printing device is explained by the above description. At the moment when the foil 1 is moved forwards, the compressed-air cylinder 16 is actuated by compressed air, thus causing the ink ribbon to be fed forwards. During the interval when the packing foil stands still, the feed facility 26 is struck, thus causing the support 29 to press the foil 1 against the ink ribbon and against the printing stamp 10. The printing stamp which is warmed up by the heating feature 11 thus presses ink from the ink ribbon onto the foil. As soon as the air has been released from the feed facility and the support 29 has moved back, the foil 1 and the ink ribbon 13 can be moved forwards again.

The building blocks can be moved on the rail arrangements 3 and 4 to cope with other packing formats.

I claim:

1. An imprinter apparatus for use in timed relation on a packaging machine for printing a legend on a web or the like moved along a path of travel, comprising:

one carrier plate having an upper marginal edge along which a web or the like to be imprinted will pass,

said carrier plate comprising a single integral thin element extending vertically and including on one side a pair of reels journaled on spaced, mutually-parallel axes of rotation transverse to the sides of said carrier plate,

one of said reels comprising a supply reel and the other comprising a take-up reel;

a ribbon, having a transferable medium, disposed on said supply reel and extending to said take-up reel;

said thin element including on the same side as said reels substantially coplanar spaced guide means, intermediate said reels, having said ribbon guidingly disposed thereon and defining a plane through which the said ribbon passes immediately beneath the upper margin of said thin plate for movement in parallel relation to the web;

a first printing member on said side of said carrier plate and having a printing means immediately beneath said plane through which said ribbon is guided;

first support rail means extending transversely of said carrier plate and including means supporting the same as a unit thereon, means removably securing said carrier plate on said first support rail means;

a second support rail means parallel to the first mentioned support rail means and overlying the same, at least one second printing member comprising a unit separate from said carrier plate, means removably supporting said second printing member on said second rail means in opposition to said first printing member and defining therebetween a printing position through which said ribbon passes and a path of travel through which the web being printed upon passes;

first power means in operative engagement with at least one of said printing members for urging it toward the other for juxtaposed engagement with

said ribbon and effecting an imprintment on the web in the path of travel; and

second power means on said single carrier plate the other side, opposite said one side, and operatively connected to one of said reels for rotating the same in step-by-step movement.

2. The structure as claimed in claim 1 including means for adjustably, transversely positioning said thin plate element and second printing members on the respective rail means upon which they are mounted transversely of the path of travel of the web being imprinted.

3. The structure as claimed in claim 2 in which said carrier plate element and printing member thereon and said second printing member each comprise one of a plurality of sets of cooperating units all removably and adjustably mounted as pairs on said rail means.

4. The structure as claimed in claim 1 including heater means on said one side of said single carrier plate element in operative engagement with said first printing member, said heater means including terminals for connection to a source of energy for heating the same, said terminals being exposed at the other side of said carrier plate element opposite that which said reels are exposed.

5. The structure as claimed in claim 1 in which said first power means is operatively connected to said second printing member and comprises a portion of the separate unit.

6. The structure as claimed in claim 5 in which said power means comprises fluid-motor, piston-and-cylinder units.

7. The structure as claimed in claim 6 including brake means operatively connected to said supply reel for insuring that the ribbon remain taut when advanced in a step-by-step movement of said take-up reel through said second power means.

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