June 21, 1938. J. G. VERGOBBI 2,121,135

CARTON FORMING MACHINE

Filed Dec. 31, 1936 2 Sheets-Sheet 1

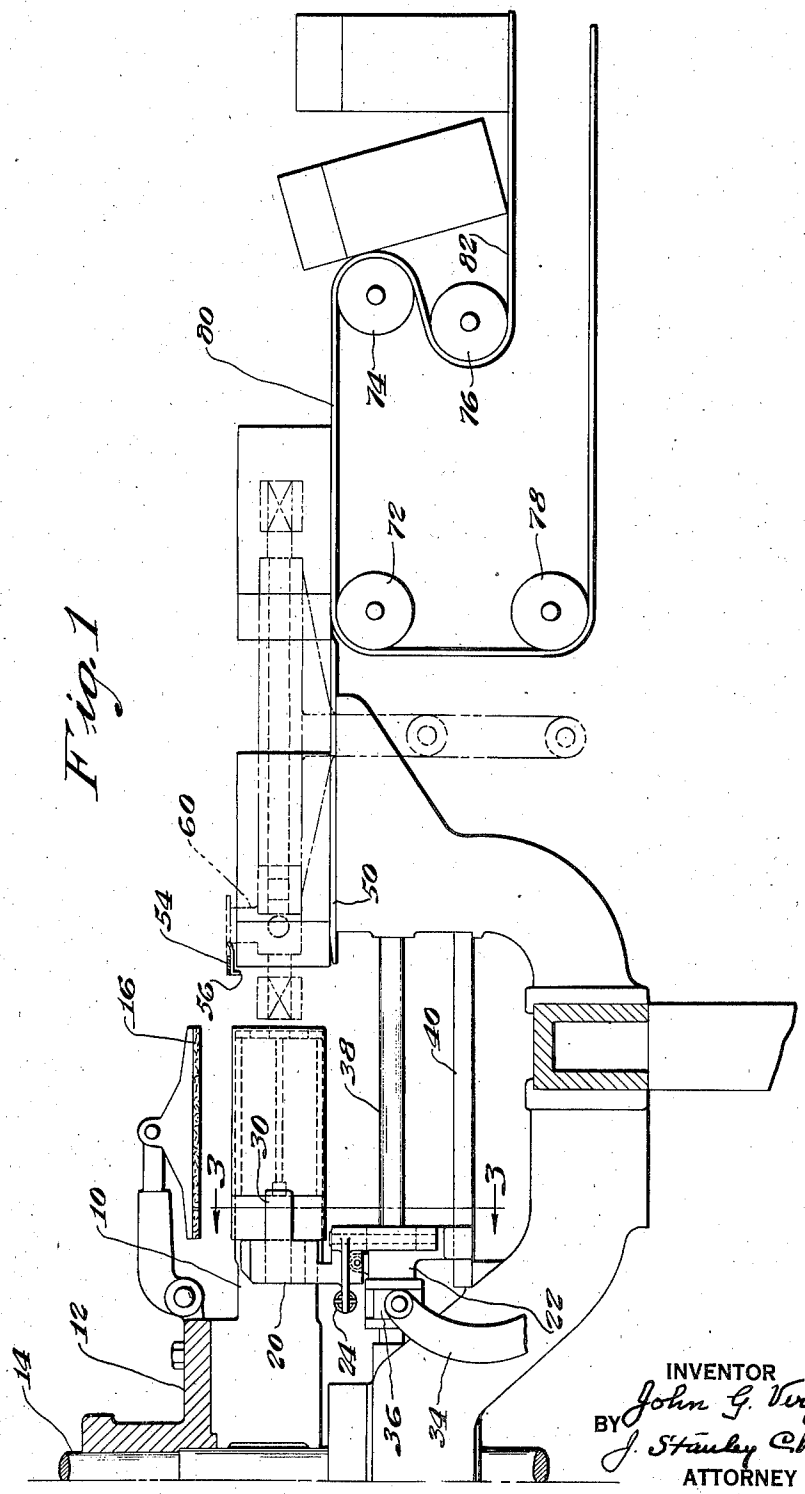


Fig. 1

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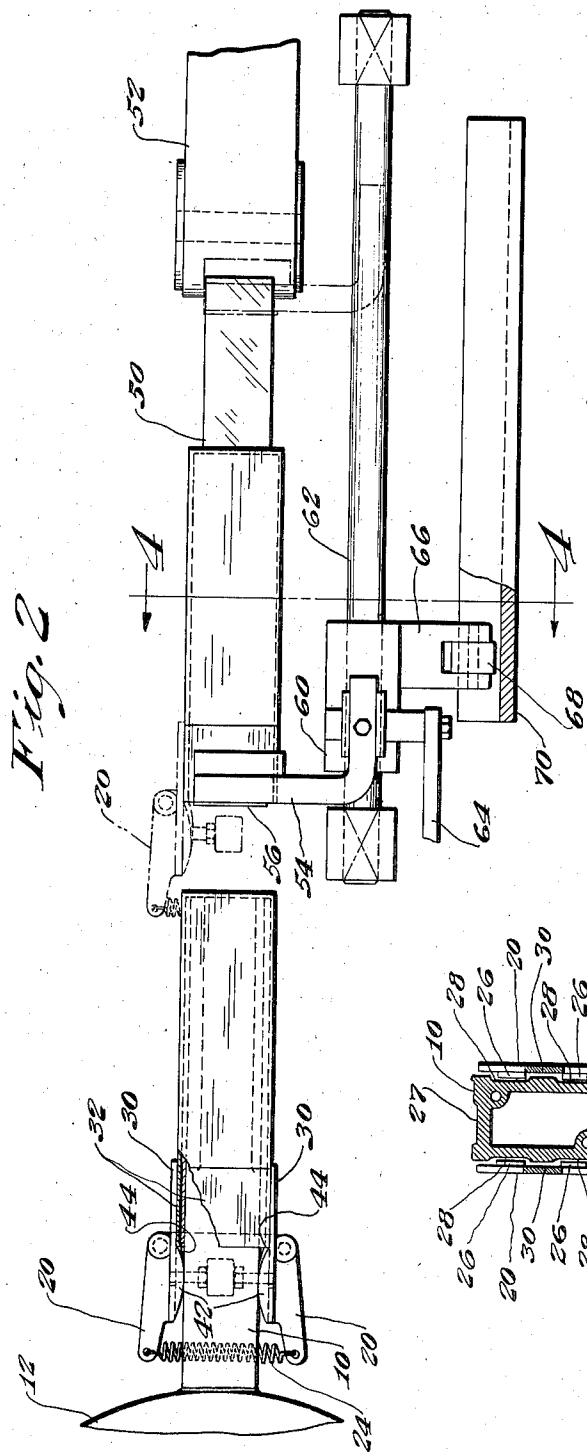


Fig. 2

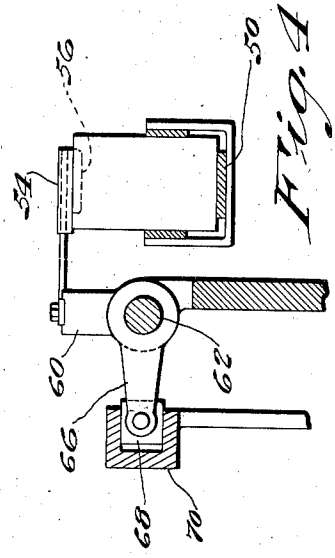


Fig. 4

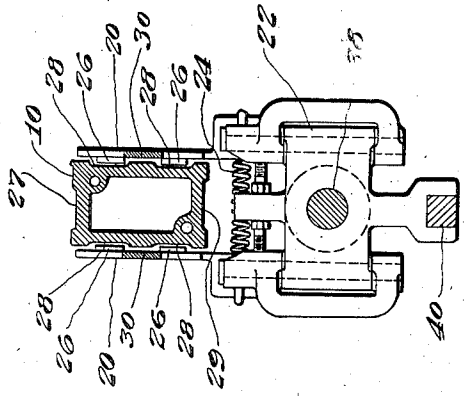


Fig. 3

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UNITED STATES PATENT OFFICE

2,121,135

CARTON FORMING MACHINE

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Application December 31, 1936, Serial No. 118,445

7 Claims. (Cl. 93—36)

This invention relates to a carton forming machine.

One object of the invention is to provide a novel and improved carton forming machine and particularly a machine of the type in which the carton is produced by wrapping the carton forming material about a forming block, and in which provision is made for removing the completed carton from its forming block in a novel, efficient and superior manner.

A further object of the invention is to provide a machine of the character specified with novel and improved mechanism for positioning a carton in an upright position after it has been removed from the carton forming machine in horizontal position.

With these objects in view and such others as may hereinafter appear, the invention consists in the carton forming machine and in the various structures, arrangements and combinations of parts hereinafter described and particularly defined in the claims at the end of this specification.

In the drawings illustrating the preferred embodiment of the invention, Fig. 1 is a side elevation, partly in section, of a sufficient portion of the carton forming machine to enable the present invention to be understood; Fig. 2 is an enlarged plan view of the carton removing mechanism; Fig. 3 is a section on the line 3—3 of Fig. 1 and Fig. 4 is a section on the line 4—4 of Fig. 2.

The present invention finds particular use in removing a carton from a forming block of a carton forming machine of the type in which the carton comprises an inner liner of paraffin coated paper and an outer wrapper of cardboard and in which the inner liner is produced by wrapping the paraffin coated paper about a heated forming block and sealing together the overlapping portions by applying pressure along the longitudinal seam to thereby soften or melt the paraffin which upon cooling will cause the overlapping portions to adhere to one another.

Prior carton removing devices of known carton forming machines are successful in removing cartons from unheated forming blocks in which the material used for the inner liner is uncoated. However, when paraffin liners were formed and sealed together on heated forming blocks it was found that the inner liner tended to adhere slightly to the forming block so that when the attempt was made to strip the completed and lined carton from the block, the extended ends or top flaps of the carton, against which the stripping members engaged, would be liable to buckle up or bend, whereby the operation of the machine was interrupted and breakage often times resulted.

In accordance with one feature of the present invention, the forming block of the carton forming machine is cut away or grooved longitudinally to provide a minimum surface for the paraffin coated liner to engage and stripping members are provided which are arranged to extend into the cut out portions of the block to facilitate the removal of the lined carton. The stripping members are also preferably provided with extensions which bear against and support the end flaps of the carton during the removal thereof to thereby prevent buckling or bending of the flaps.

Another feature of the present invention resides in the provision in a carton forming machine of a device for positioning the carton in an upright position on a conveyor after it has been removed from the forming block in a horizontal position so that the cartons may be conveniently conveyed to filling and sealing machines.

Referring now to the drawings which illustrate the preferred embodiment of the invention, only a sufficient portion of the carton forming machine has been illustrated and will be hereinafter described as will enable the present invention to be understood. In the well known carton making machines of this type a plurality of forming blocks 10, only one of which is shown, are radially mounted on a disk 12 secured to a central shaft 14. The central shaft 14 is rotated intermittently through known means so that the forming blocks arrive successively at well known mechanisms by means of which the blank is first folded around the forming block to form a tube and the overlapping portions of said tube are heat sealed together by a pressure member 16 to form the longitudinal seam of the liner. At subsequent stations the bottom of the liner is folded over to produce the bottom of the bag and thereafter an outer wrapper of cardboard is wrapped about the liner and block to produce the composite carton.

In order to remove the thus completed carton from the forming block, stripping members 20 are provided which are pivotally mounted upon a slide member 22 and yieldingly urged against the sides of the forming block 10 by a spring 24. The strippers are provided with tongues 26 which are adapted to fit into grooves 28 cut in the forming block 10. As hereinbefore stated other portions of the forming block are cut away, as at 27, 29, to provide a minimum surface for the liner to contact. Extensions 30 are provided to support the end flaps 32 of the carton so that in

operation the flaps will be held rigidly against the sides of the forming block.

The stripping members 20 are preferably arranged to be reciprocated, longitudinally of the block, by the usual connections to the slide member 22 including a lever 34 and sliding connection 36, the lever 34 being rocked in any usual or preferred manner to slide the member 22 along the supporting rod 38. A guide bar 40 holds the slide member 22 in its vertical position. The reciprocation of the stripping members is timed so that the stripping operation takes place when the intermittently operated forming blocks are at rest.

In operation the stripping members 20 slide over the carton on the block and when they pass the ends of the carton flaps 32 the forward portion 42 of the stripping members are yieldingly urged inwardly against the block so that when they are again returned the hooked portions 44 engage the ends of the carton and strip the carton from the block. As herein shown, the forward portions 42 are curved to guide the strippers onto the block during the forward stroke.

After the carton has been stripped from the block it comes to rest on a stationary shelf 50 from which, during the succeeding cycle of operations, it is transferred to a moving belt 52. The belt 52 forms a part of a tip-over conveyor which is arranged to tip the carton from its horizontally inclined position to an upright position so that the carton may be transported directly to filling and sealing machines.

The mechanism for transferring the carton from the stationary shelf 50 to the moving belt may comprise any of the usual mechanisms used for this purpose, and as herein illustrated the transferring member 54, which is provided with a hooked portion 56, is arranged to be reciprocated on a slide member 60. The slide member 60, supported on a rod 62 may be operated in any usual or preferred manner through connections to a link 64. Provision is made for rocking the transferring member so that at the end of its transferring operation the member is raised above the carton, during its forward stroke and when it passes the top flaps 32 of the carton it is again rocked down to its normal position so that the hooked portion 56 will engage the end of the carton during its retracting stroke. As herein shown the slide member is provided with an extension 66 which carries a slide block 68 swivelly mounted at its outer end. The slide block is arranged to slide in a U-shaped bar 70 which, during the operation of the machine, is arranged to be elevated and lowered by any suitable means, to provide the necessary motion for rocking the transferring member 54 as described.

The moving belt 52, driven in any usual or preferred manner, is supported upon pulleys 72, 74, 76, 78 which are arranged to form two different levels of the belt along the conveying surface whereby the horizontally inclined carton delivered to the upper level 80 will fall to the lower level 82, bottom first so that the carton will be in an upright position on the lower level 82. Suitable guides, not shown, are provided to guide the carton on the conveyor.

While the preferred embodiment of the invention has been herein illustrated and described, it will be understood that the invention may be embodied in other forms within the scope of the following claims.

Having thus described the invention, what is claimed is:—

1. In a carton forming machine, in combination, a forming block having longitudinally extended grooves in a plurality of the surfaces thereof for reducing the area of contact between the block and a carton formed thereon, said grooves forming relatively narrow bearing surfaces for the carton, means for heat sealing the carton while supported on the block, and means projecting into some of the grooves and movable longitudinally thereof for stripping the carton from the block.

2. In a carton forming machine, in combination, a forming block having longitudinally extended grooves in a plurality of the surfaces thereof for reducing the area of contact between the block and a carton formed thereon, said grooves forming relatively narrow bearing surfaces for the carton, means for heating the block to heat seal the carton, and means projecting into some of the grooves and movable longitudinally thereof for stripping the carton from the block.

3. The combination with a horizontal forming block upon which a carton may be formed by wrapping about the block, of means for stripping the carton from the block, a horizontal conveyor having one portion thereof arranged to receive and convey the cartons in a horizontal position as they are stripped from the block and having another portion arranged at a lower level than said first portion whereby to permit the horizontally conveyed cartons to automatically tip over into a vertical position as they fall from the first to the second portions of said conveyor.

4. The combination with a horizontal forming block upon which a carton may be formed by wrapping about the block, of means for stripping the carton from the block, a length of conveyor arranged at substantially the level of the block for receiving the cartons in a horizontal position, a second length of conveyor arranged at a level sufficiently below the level of the first length of conveyor to permit the horizontally conveyed cartons to automatically tip into a vertical position as they fall from the first to the second conveyor.

5. In a machine of the character described, the combination with a horizontally disposed forming block, of conveying means for receiving cartons in a horizontal position as they are delivered from said forming block, said conveying means having provision for automatically tipping the cartons on end during the conveyance thereof.

6. In a machine of the character described, the combination with a horizontally disposed forming block, of means for receiving cartons in a horizontal position as they are delivered from said block, and means for tipping said cartons on end and conveying them from the machine.

7. In a carton forming machine, in combination, a forming block having longitudinally extending grooves in each surface thereof to provide the block with relatively narrow bearing surfaces to thereby reduce the area of contact between the block and the carton formed thereon, means for heat sealing the carton while supported on the block and stripping means projecting into said grooves and each comprising a curved member provided with a hooked portion for engaging the ends of the flaps of the carton and an extended portion adapted to provide a support for the flaps while being engaged and moved by said hooked portion.

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