

May 23, 1961

O. M. TOENNIES
PACKAGING MACHINE

2,985,076

Filed Feb. 29, 1960

4 Sheets-Sheet 1

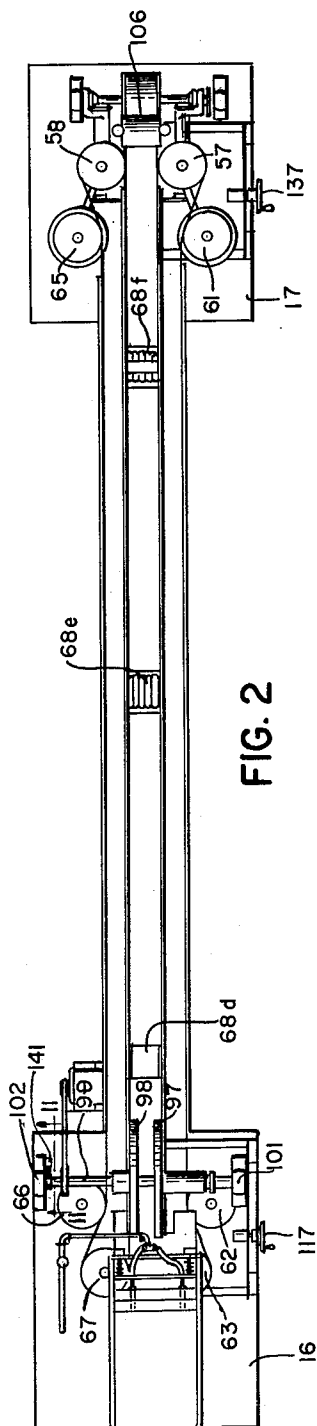


FIG. 2

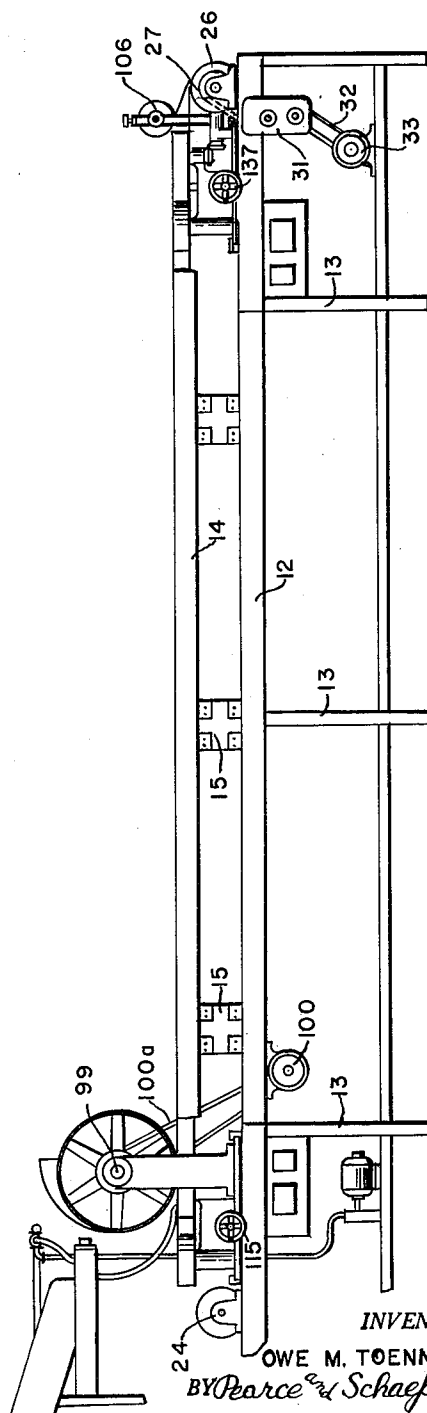


FIG. 1

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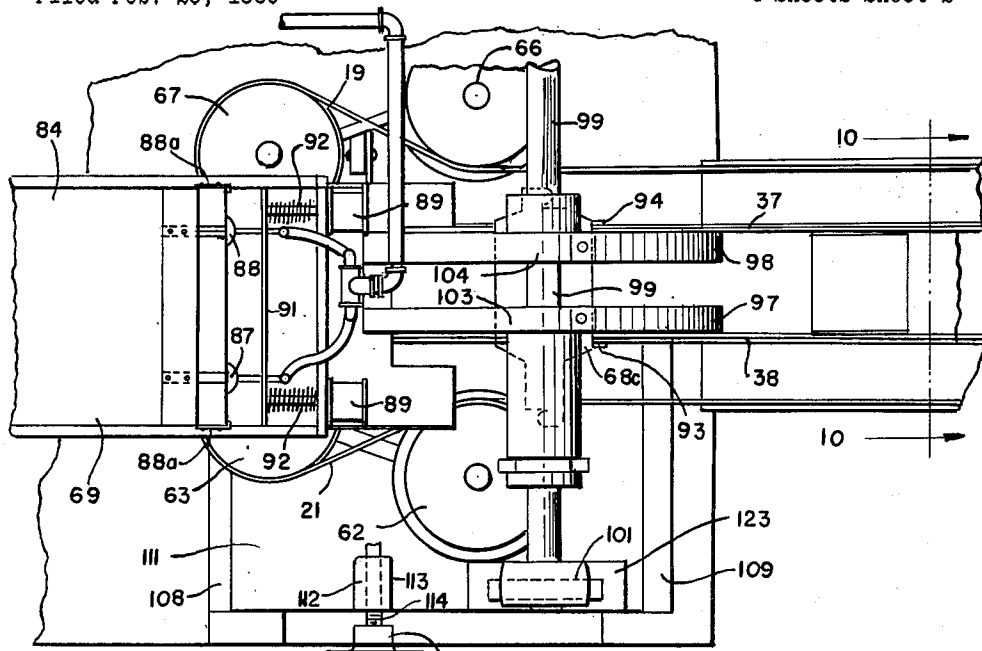


FIG. 3

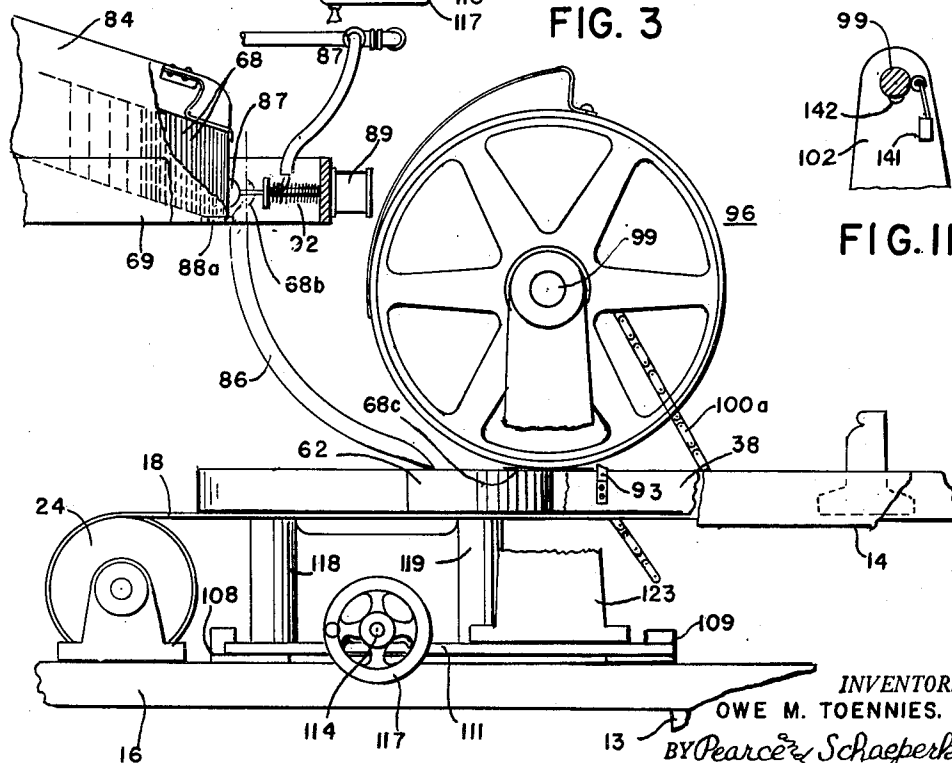


FIG. II.

FIG. 4.

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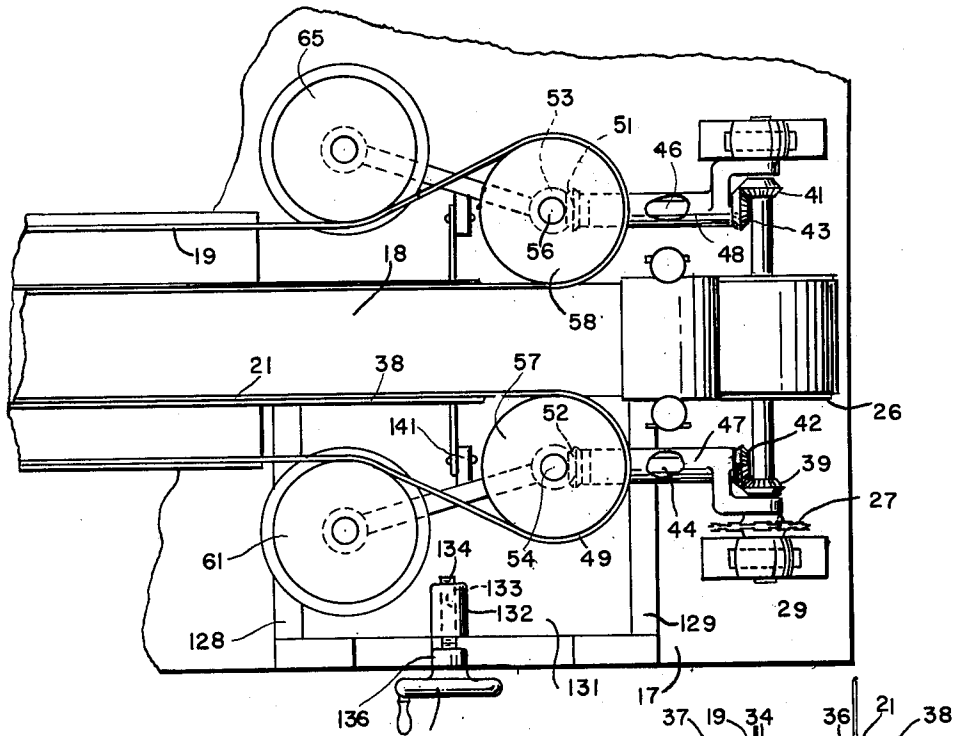


FIG. 5.

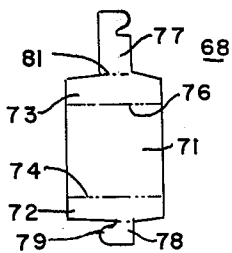


FIG. 9.

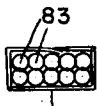


FIG. 10.

FIG. 8.

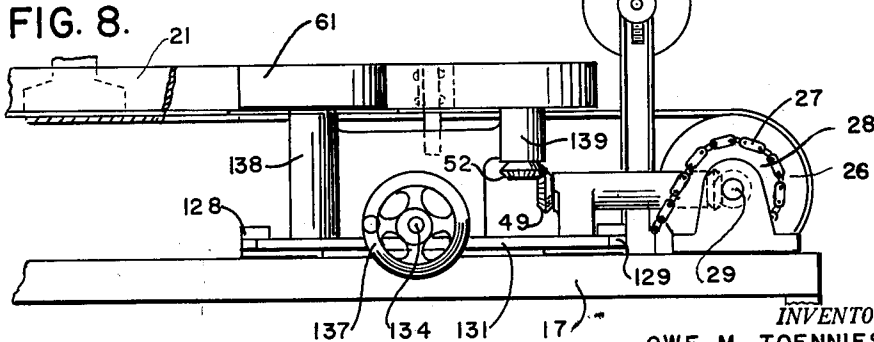


FIG. 6.

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FIG. 7.

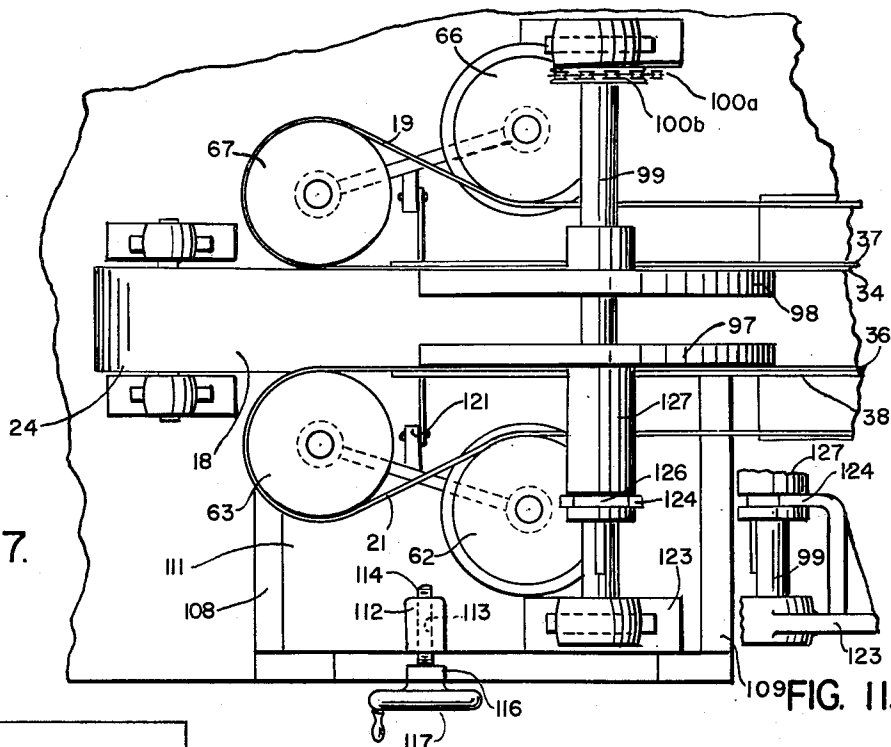


FIG. 11.

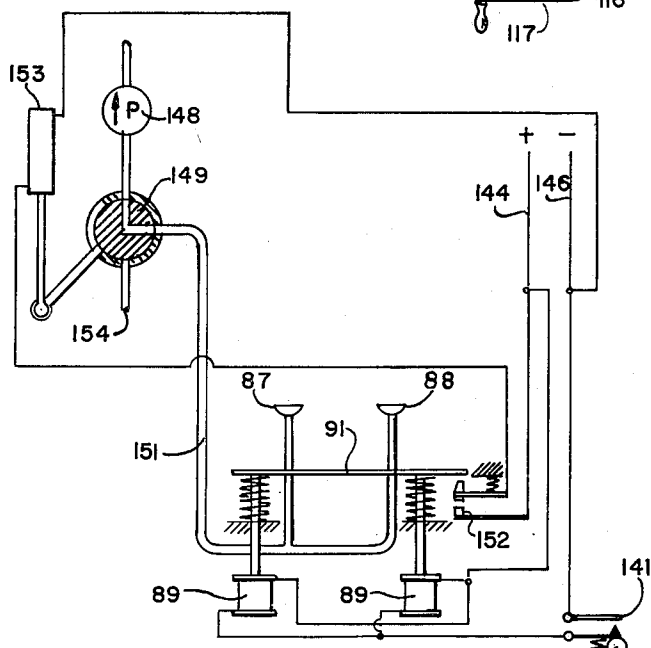


FIG. 12.

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PACKAGING MACHINE

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4 Claims. (Cl. 93—49)

This invention relates to a packaging machine. More particularly this invention relates to a machine for packaging meat products and the like such as frankfurters and the like.

An object of this invention is to provide a machine having a conveyor arrangement for transporting paper-board packaging members past a loading station where linked meat products can be placed therein.

A further object of this invention is to provide a machine of this type having three moving belts forming a conveyor having a moving base and moving side walls between which a package-forming card is received so that linked meat products can be placed inside the card for packaging.

A further object of this invention is to provide a device of this type in which cards are fed to a station adjacent the belts and in which a cam wheel engages each card and folds the card into position between the belts for ready loading.

The above and other features and objects of the invention will be apparent to those skilled in the art to which this invention pertains from the following detailed description, and the drawing, in which:

Fig. 1 is a view in side elevation showing a machine constructed in accordance with an embodiment of this invention;

Fig. 2 is a plan view of the machine illustrated in Fig. 1;

Fig. 3 is an enlarged fragmentary plan view showing a card-feeding end of the machine;

Fig. 4 is a fragmentary view in side elevation of the card-feeding end of the machine one card and a card feeder being shown in card-feeding position in dot-dash lines;

Fig. 5 is an enlarged fragmentary plan view showing a discharge end of the machine, partly broken away and in section to reveal structural details;

Fig. 6 is an enlarged fragmentary view in side elevation showing the discharge end of the machine;

Fig. 7 is a plan view of the card-feeding end of the machine with a card-feeding assembly thereof removed;

Fig. 8 is a plan view of one card for use with the machine, score lines being shown in dot-dash lines;

Fig. 9 is a view in end elevation showing a package of linked meat products formed on the machine;

Fig. 10 is a view in section taken on the line 10—10 in Fig. 3;

Fig. 11 is a view in section taken on the line 11—11 in Fig. 2; and

Fig. 12 is a schematic view showing electrical and pneumatic connections of the machine.

In the following detailed description, and the drawing, like reference characters indicate like parts.

In Figs. 1 and 2 is shown a machine constructed in accordance with an embodiment of this invention. The machine includes a main frame 12 mounted on legs 13. A belt-supporting table 14 is supported above the main

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frame 12 on supports 15. A feed frame table 16 and a discharge frame table 17 are mounted at opposite ends of the main frame 12.

A belt assembly travels on the belt-supporting table 14. The belt assembly includes a main conveyor belt 18 and continuous side belts 19 and 21 (see Fig. 10). The main belt includes upper and lower courses 22 and 23 which are substantially horizontal. The main belt runs on pulleys 24 and 26. (Fig. 1.) The pulley 24 is an idle pulley. The pulley 26 is driven by a chain 27 (see Figs. 1 and 6), which runs on a sprocket wheel 28 (Fig. 6) mounted on a shaft 29, which carries the pulley 26. The chain 27 (Fig. 1) is driven by gearing (not shown) inside a gear box 31. The gearing is driven by a belt 32 which, in turn, is driven by a motor 33.

Inner courses 34 and 36 (Fig. 10) of the belts 19 and 21, respectively, are upright in position and ride upon the upper course 22 of the main belt. Upright guide walls 37 and 38 guide the inner courses 34 and 36. The belts 20 form a moving conveyor of upwardly opening channel shape.

The drive for the belts 19 and 21 is shown most clearly in Fig. 5. Beveled gears 39 and 41 are mounted on the shaft 29. The beveled gears 39 and 41 drive meshing beveled gears 42 and 43, respectively. The beveled gears 42 and 43 are mounted on shafts 44 and 46, respectively, which are rotatably mounted inside bearing sleeves 47 and 48, respectively. Beveled gears 49 and 51, mounted on the shafts 44 and 46, respectively, engage beveled gears 52 and 53, respectively, which are mounted on vertical shafts 54 and 56, respectively. The shafts 54 and 56, in turn, carry pulleys 57 and 58, respectively, on which the belts 21 and 19, respectively, run. The belt 21 passes from the pulley 57 around idle pulleys 61, 62, and 63 (Fig. 2). Similarly, the belt 19 passes from the pulley 58 around idle pulleys 65, 66, and 67.

Cards 68 (Figs. 3 and 8), are fed to the belt assembly by a card-feeding mechanism indicated generally at 69. Each card 68 is of the shape shown in Fig. 8 and has a base panel 71, side panels 72 and 73, hinged to the base panel 71 at score lines 74 and 76, respectively, and hook portions 77 and 78, which are hinged to the side panels 72 and 73, respectively, at score lines 79 and 81, respectively. The card 68 is adapted to be folded around a group of frankfurters 83 (Fig. 9) or the like to hold the frankfurters in a unitary package.

Details of the card-feeding device are shown in Figs. 3 and 4. The card-feeding device can be generally of the type shown and claimed in my co-pending application Serial No. 791,098, filed February 4, 1959. A supply of cards 68 is mounted in a hopper 84. Cards are delivered from the hopper 84 into a chute 86 by vacuum cup feeders 87 and 88. The lowermost card 68a (Fig. 4) in the hopper rests against stops 88a. The card 68a is engaged by the vacuum cup feeders, and a vacuum is impressed on the vacuum cups of the feeders. Then solenoids 89 are energized. The solenoids 89 draw a frame member 91 to the right as shown in Figs. 3 and 4, compressing springs 92. The vacuum cups are drawn to the right with the frame member 91 to the position in which the vacuum cup 87 is shown in dot-dash lines and in which a card 68b is shown in dot-dash lines in Fig. 4. Then the vacuum is released, and the card can fall downwardly along the chute 86 to the position where a card 68c is shown in Fig. 3. At this position, the card engages stops 93 and 94, which are mounted on the side walls 38 and 37, respectively.

When the card is at the position 68c, it is beneath a cam wheel assembly 96 (Fig. 4). The cam wheel assembly 96 consists of two sections 97 and 98 (Fig. 3) which are mounted on a shaft 99. The shaft 99 is rotatably mounted in bearings 101 and 102 (Fig. 2). The

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shaft 99 is driven by a motor 100 (Fig. 1) which drives a chain 100a. Chain 100a runs on a sprocket wheel 100b (Fig. 11) mounted on the shaft 99.

Sections 97 and 98 of the cam wheel assembly include cam projections 103 and 104 (Fig. 3), respectively, which engage the card 68c as the cam wheel assembly rotates to fold the card between inner courses of the side belts 19 and 21 to the position shown in Fig. 10. Then the card progresses along the machine carried by the belts. As the card moves along the belts, an operator can insert an appropriate number of frankfurters or the like in the card as indicated at the card 68e in Fig. 2, and a second operator can fold the hooked portions of the card together and close the package as indicated at the card 68f in Fig. 2. Thereafter, the card and frankfurters thereon can pass beneath an idle weight roll 106 which compresses the packages. Finally, the packages are delivered at the right hand end of the machine as shown in Figs. 1 and 2, onto an appropriate package receiving mechanism (not shown).

The side belt 21, the cam wheel section 97 and the guide wall 38 can be moved crosswise of the main belt 18, to adapt the machine for handling packages of varying widths. As shown in Figs. 3 and 4, tracks 108 and 109 are mounted on the feed frame table 16. A sliding table 111 is mounted on the tracks 108 and 109 for sliding transversely of the feed frame table 16. A lug 112 mounted on the sliding table 111 is provided with a transverse bore 113 (Fig. 3) in which a shaft 114 is threaded. The shaft 114 is rotatably mounted in a lug 116 which, in turn, is mounted on the feed frame table 16. A hand wheel 117, mounted on the shaft 114, can be turned to advance the sliding table 111 transversely of the feed frame table 16. As shown in Figs. 4 and 7, bearing supports 118 and 119, which carry pulleys 62 and 63, are mounted on the sliding table 111. In addition, a hanger frame 121, (Fig. 7), which carries one end of the guide wall 38, is mounted on the sliding table 111 and a bearing support frame 123 is also mounted on the sliding table. One end of the shaft 99 is rotatably mounted in a bearing at the upper end of the bearing support frame 123. As shown in Figs. 7 and 11, the bearing support frame 123 carries a yoke 124 which fits into a groove 126 in the hub 127 of the cam wheel section 97 so that the section 97 moves therewith.

Similarly, the discharge frame table 17 (Figs. 5 and 6) carries transverse tracks 128 and 129 in which a sliding table 131 is mounted. A lug 132 (Fig. 5) mounted on the sliding table 131 has a transverse bore 133 in which a transverse shaft 134 is threaded. The shaft 134 is rotatably mounted in a lug 136, which is carried by the discharge frame table 17. A hand wheel 137, mounted on the shaft 134, can be turned to move the sliding table 131 transversely of the discharge frame table 17. Bearing supports 138 and 139 which carry the pulleys 61 and 57, respectively, are mounted on the sliding table 131. In addition, a support 141, which carries the right-hand end of the guide wall 38, is also mounted on the sliding table 131. When the hand wheels 117 and 137 are turned the sliding table 111 and 131 move transversely of the main conveyor belt 18 to move the side belt 21 and the guide wall 38 transversely of the main belt and to move the cam wheel section 97 transversely of the main belt.

A switch 141 (Fig. 11) for operating the card-feeding device is mounted on a bearing support 142 adjacent the shaft 99. A cam 142, mounted on the shaft 99, is engageable with the switch 141 so that the switch 141 is operated each time the shaft 99 turns. Operation of the card-feeding device can best be understood by reference to Fig. 12 in which electrical power leads are indicated at 144 and 146. When the switch 141 is open, the solenoids 89 are de-energized, and vacuum cups 87 and 88 can engage a card in the hopper 84 (see Fig. 4). A suction pump 148 (Fig. 12) draws a vacuum on the vacuum

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cups through a valve 149 and a line 151. Then, when the switch 141 is actuated, the solenoids 89 are energized and draw frame member 91 and the vacuum cups downwardly as shown in Fig. 12 (to the right as shown in Figs. 3 and 4) to release the card from stops 88a (Figs. 3 and 4). As the frame member 91 moves, it actuates a switch 152 to energize a solenoid 153. The solenoid 153 actuates the valve 149 to disconnect the section pump 148 from the line 151 and to connect the line 151 to an exhaust line 154, whereupon the card is released by the vacuum cups to fall down the chute 86 to the position where the card 68c is shown in Fig. 4. The card is then folded between the side belts by the sections of the cam wheel assembly and progresses along the machine to be loaded and closed, as already explained hereinabove.

The machine illustrated in the drawings and described above is subject to structural modification without departing from the spirit and scope of the appended claims.

Having described my invention, what I claim and desire to obtain by Letters Patent is:

1. A card-feeding machine which comprises a pair of side belts, each of said side belts having an upright course, said upright courses being parallel and spaced sufficiently to receive a package-forming card therebetween, means for advancing both said side belt courses in the same direction and at substantially the same speed, card supports adjacent the side belts for holding a card in registry with said side belt courses, a cam wheel mounted for rotation upon an axis extending transversely of said belt courses, and a cam on said cam wheel engageable with a card positioned on said card supports to fold the card between the side belt courses in position for loading.

2. A card-feeding machine which comprises a main conveyor belt having a substantially horizontal course, a pair of side belts, each of said side belts having an upright course for overlying said substantially horizontal course, said upright courses of the side belts being substantially parallel and being spaced sufficiently to receive a package-forming card therebetween, means for advancing all said belt courses in the same direction and at substantially the same speed, card supports adjacent the side belts for holding a card above and in registry with said side belt courses, a cam wheel mounted above said belt courses for rotation upon an axis extending transversely of said belt courses, and a cam on said cam wheel engageable with a card positioned on said card supports to fold the card between the side belt courses in position for loading.

3. A card-feeding machine which comprises a pair of side belts, each of said side belts having an upright course, said upright courses of the side belts being substantially parallel and horizontal and spaced sufficiently to receive a package-forming card therebetween, means for advancing both said belt courses in the same direction and at substantially the same speed, card supports adjacent and immediately above the side belts for holding a card above said side belt courses, a cam wheel mounted above said belt courses for rotation upon an axis extending transversely of said belt courses, and a cam on said cam wheel engageable with a card positioned on said card supports to fold the card between the side belt courses in position for loading.

4. A card-feeding machine which comprises a pair of side belts, each of said side belts having an upright course, said upright courses of the side belts being substantially parallel, and horizontal and spaced sufficiently to receive a package-forming card therebetween, means for advancing both said belt courses in the same direction and at substantially the same speed, card supports adjacent and immediately above the side belts for supporting a card above said side belt courses, a cam wheel mounted above said belt courses for rotation upon an axis extending transversely of said belt courses, stop

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members mounted on said card supports outboard of said belt conveyors for holding the card and a cam on said cam wheel engageable with a card positioned on said card supports to fold the card between the side belt courses in position for loading and to free the card from the stop members, whereby the card advances with said belt courses.

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