

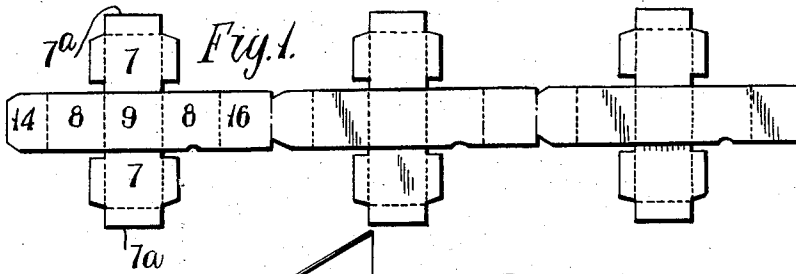
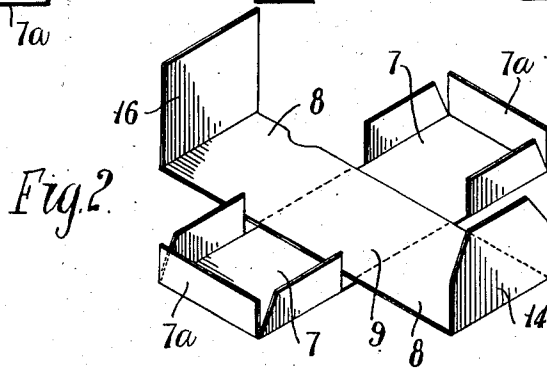
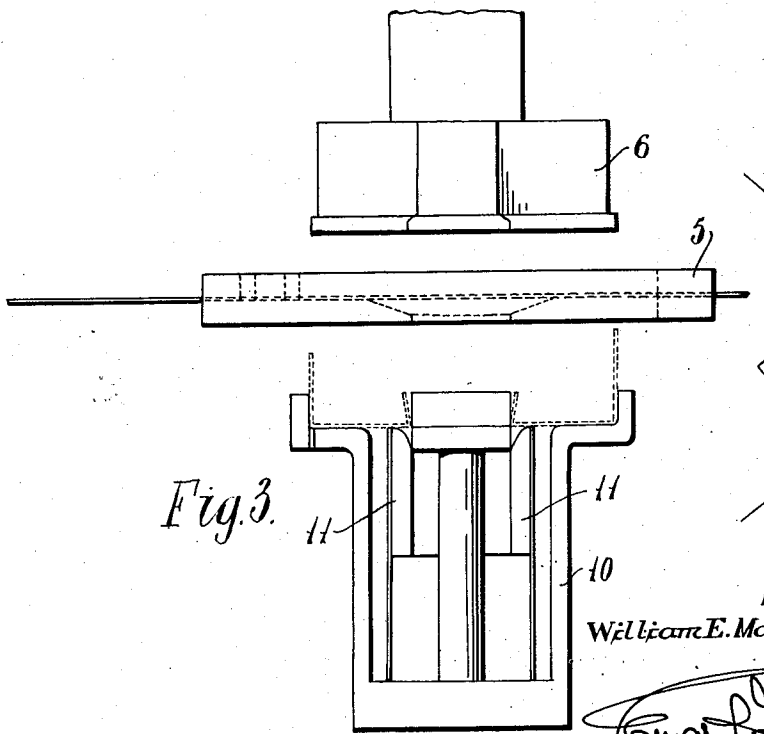
Aug. 5, 1952

W. E. MacKENZIE
CARTONING MACHINE

2,605,598

Filed Aug. 25, 1947

5 Sheets-Sheet 1



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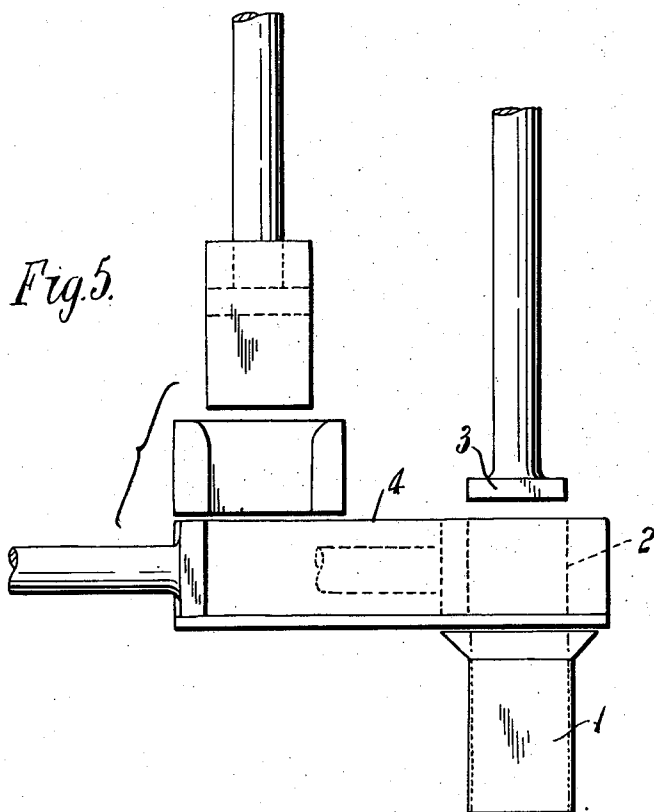
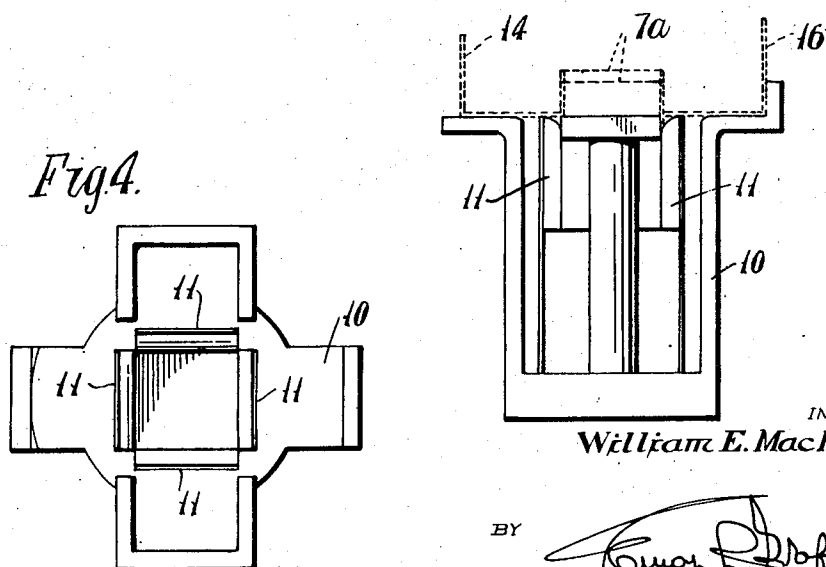
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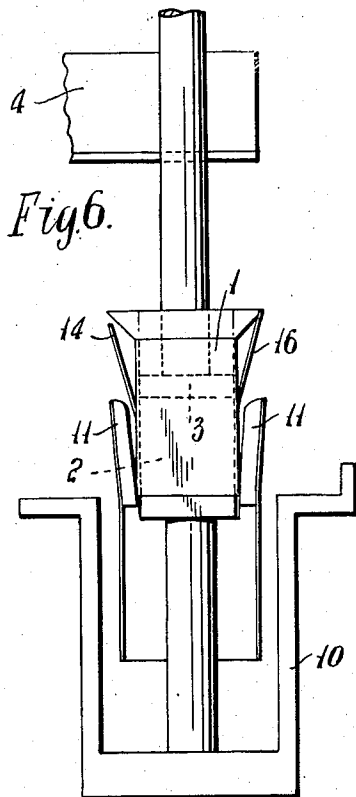
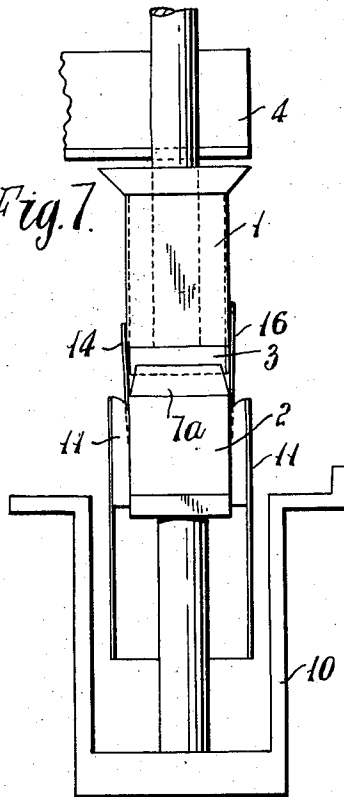
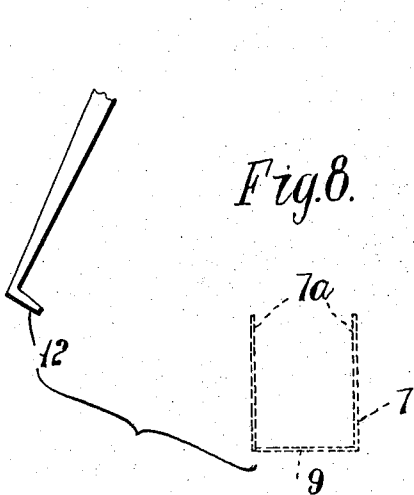
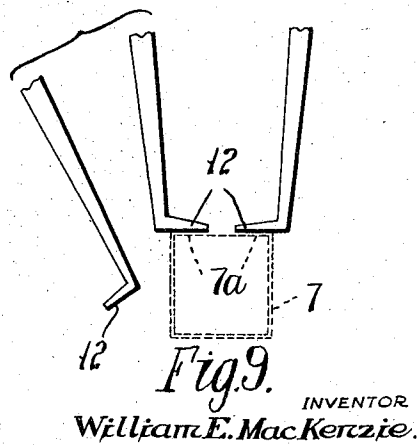
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W. E. MacKENZIE
CARTONING MACHINE

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5 Sheets-Sheet 3



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2,605,598

CARTONING MACHINE

Filed Aug. 25, 1947

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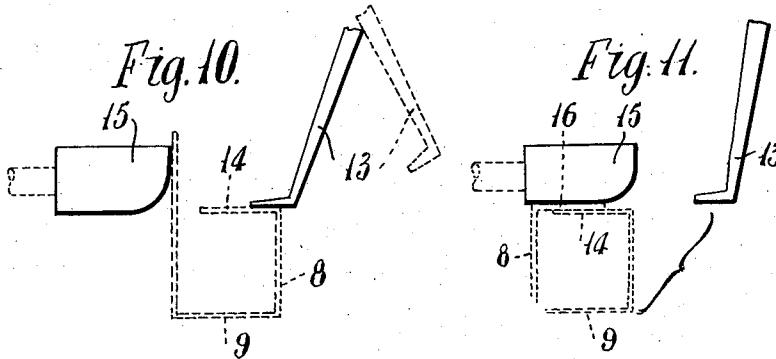
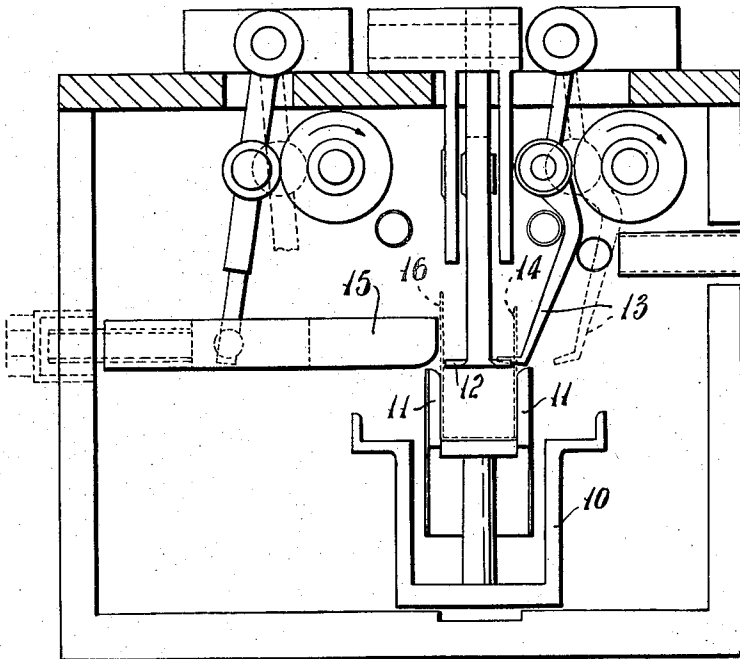


Fig. 12. INVENTOR William E. MacKenzie.

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W. E. MacKENZIE
CARTONING MACHINE

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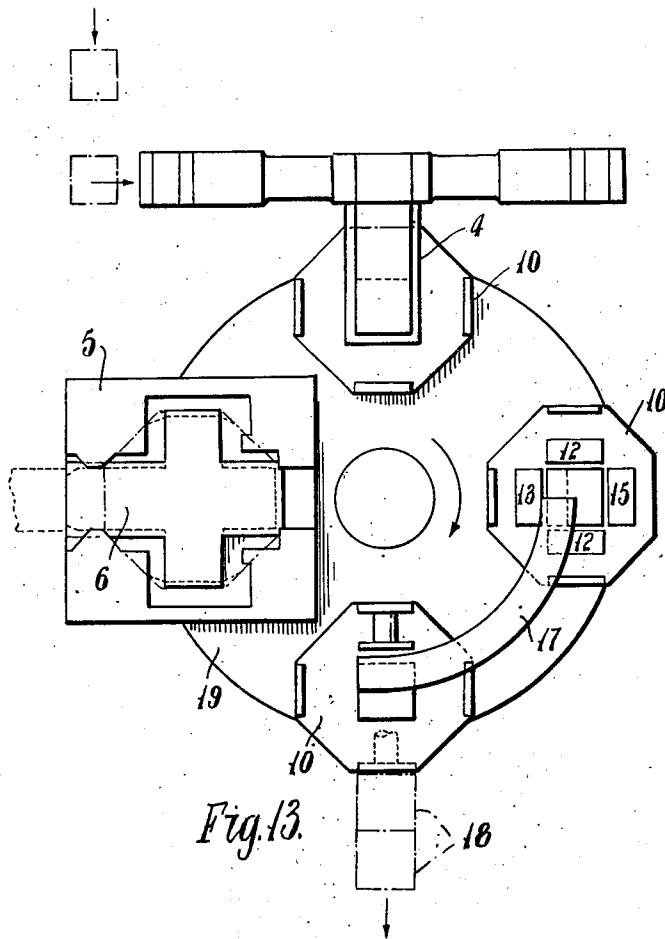


Fig. 13.

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UNITED STATES PATENT OFFICE

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CARTONING MACHINE

William Ewan MacKenzie, South Croydon,
EnglandApplication August 25, 1947, Serial No. 770,511
In Great Britain August 26, 1946

4 Claims. (Cl. 53—108)

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This invention relates to cartoning machines and is more particularly, although not exclusively, concerned with the cartoning of solid cubes of meat extract after the cubes have previously been wrapped in a protective inner wrapping of relatively thin material.

The disadvantages of existing cartoning machines are:

(a) The folding of the carton about the wrapped cube is effected by many different folding operations involving the use of different mechanism associated with each folding stage.

(b) Difficulty is often experienced in separating the individual cartons from the magazine and feeding the cartons squarely and positively ready for the first folding operation.

(c) Variation in the location and depth of scoring on the carton permits folding to occur away from the correct position at the corners of the pack.

(d) Curling of the cartons occurs which hinders feeding and correct folding operations.

(e) Gum feeding and applying devices are not positive and require considerable maintenance and running attention.

(f) The wrapped cube is usually employed as a former for shaping the relatively heavy carton cover which results in compression and distortion of the cube.

The object of the present invention therefore is to provide a machine whereby the foregoing disadvantages are overcome.

Broadly, according to the present invention, there is provided a cartoning machine wherein the article to be wrapped is advanced against the carton blank while contained within the lower end of a chute through which the article is delivered, means being provided for folding the walls of the carton around the lower end of the chute which comprises side walls corresponding in shape to the shape of the article, means for withdrawing the chute from the carton and for retaining the article in the latter and further means for completely folding the carton to cover the remaining face of the article away from which the chute is withdrawn.

By means of the present invention the floor and side walls of the carton are folded about the article in a single folding operation and only a second folding operation is necessary to fold the carton to close the remaining wall of the article. This second folding operation may include or be followed by means for effecting sealing of the carton.

To enable the cartons to be easily fed from a

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magazine the cartons in the form of blanks are folded concertina fashion and are cut into individual blanks as they leave the magazine and they are then acted upon by dies to form the blanks each with tray-like parts which embrace two opposite sides of the cube leaving portions adapted to embrace adjacent sides and the dies also form folds in the sides which eventually cover the top of the cubes. Preferably, all folds produced with the dies and with the chute occur on lines which have previously been scored at the time the carton blanks were produced.

In order that the invention may be clearly understood and readily carried into effect, reference will now be made to the accompanying sheets of drawings which illustrate one embodiment of the invention as applied to the cartoning of cubes of meat extract referred to and which have already been wrapped in an inner protective wrapping of relatively thin material.

In the drawings:

Figure 1 is a plan view showing a strip of cartons before they are divided into individual blanks.

Figure 2 is a perspective view showing one of the blanks when it is delivered on to a carrier member subsequent to the first folding operation.

Figure 3 is a view showing suitable stamp and die means for shaping the blank as it appears in Figure 2.

Figure 4 is a plan view of a carrier.

Figures 5, 6 and 7 illustrate mechanism for effecting the first folding operation for folding the carton about four sides of the cube.

Figures 8 to 11 are diagrammatic views illustrating the folding at the second folding operation.

Figure 12 is a view of the mechanism illustrated diagrammatically in Figures 8 to 11, and

Figure 13 is a plan view of the complete machine.

Referring to the drawings the mechanism comprises a chute 1 (see Figures 5, 6 and 7), through which the wrapped cubes 2 are fed successively by a plunger 3 from a trough 4 and means is provided for moving the chute 1 axially towards a support carrying the carton.

The cartons are preferably fed in strip form (as shown in Figure 1) from a magazine, the strip comprising a plurality of blanks arranged end to end. Each blank comprises two relatively narrow strips disposed at right angles in the form of a cross. The strip of cartons as it leaves the magazine passes between cutting mechanism which serves to cut the strip into

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individual blanks and the blanks are then fed successively between a die 5 and a punch 6 (see Figure 3) which are closed together to form in one of the strips of each blank two spaced apart troughs 7 (see Figure 2) for embracing the sides of the cube, the laterally disposed strip 8 of each blank being at the same time folded between panels 8 and 16 and 8 and 14 and being adapted to be wrapped around the end and top of the cube whilst the intersecting portions of the strips of the blank constitute a base or floor 9.

During the formation of the blank it is transferred by the punch 6 passing through the die 5 on to a support or carrier 10 which is then moved and disposed below the chute 1 as shown in Figure 5. The wrapped cube 2 comes to rest within the chute 1 with its lower side approximately flush with the lower end of the chute which rests upon the centre or floors of the carton. The next operation consists in folding the two tray-like portions 7 of the carton about the sides of the cube and the transverse strip 8 around the ends of the cube.

Located below the carton carrier 10 are four vertical folding blades or members 11 which are moved upwardly and in so doing fold the carton around the four sides of the lower end of the chute (as shown in Figure 6). The chute 1 is then moved upwardly in advance of the plunger 3 as shown in Figure 7 so that the cube 2 is held on to the base 9 of the carton and is enveloped by the boxlike structure of the carton as the chute 1 moves upwardly. The plunger 3 is then raised, leaving the carrier 10 with the partially cartoned cube to pass on to the next stage. Any suitable mechanism may be employed for imparting reciprocal movement to the folding members 11 of the carrier 10, the axially movable chute 1 and to the plunger 3 which is movable in the chute. For example, such means may comprise fulcrum levers which are connected at one side of their fulcrums to means for moving the chute and for moving the plunger, said means being guidably supported by any suitable guiding mechanism. During this operation the two folds between panels 8 and 16 and 8 and 14 are sprung open and are afterwards closed by parts 13 and 15 (about to be described) the closing of these parts being easily and accurately effected due to the prior formation of the fold lines by the die 5 and punch 6.

The carrier 10 then moves on to the next stage to effect the folding of the carton over the top of the cube as illustrated in Figures 8 to 12 and passes between suitable guide means and a pair of wiping elements 12 are brought together pincer fashion to turn the ends 7a of each tray-like part 7 of the carton over the top of the cube and then these wiping elements 12 are withdrawn simultaneously with the action of a third wiping element 13 acting at right angles which folds a tongue 14 on a non tray-like part over the just folded over portions 7a and the fourth wiping element 15 then moves transversely (see Figure 11) over the remaining end 16 of the strip simultaneously with the withdrawal of the third wiping element 13.

The carrier 10 then moves onwards to bring the cartoned cube below a heating element which is adapted to touch a heating medium or adhesive applied to the tongue 16 of the strip to seal this tongue to the portion 14 of the carton located below it.

A completely cartoned cube is now moved by its carrier 10 and passes below a pressure plate

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17 (see Figure 13) which acts as a cold plate and cools the just heated part of the carton, the completely cartoned and sealed cubes leaving the machine at 18.

The cartoning mechanism above described is preferably carried by a rotor 19 (see Figure 13) rotatable in a horizontal plane which is rotated intermittently to move the carriers 10 for the cubes through the different stages. Although the mechanism provided by this invention may be advantageously employed for use in conjunction with any wrapping machine for applying an inner wrapping to the cubes before they are cartoned, the invention is well suited to the wrapping machine described in my co-pending patent application Serial No. 770,512, now Patent No. 2,590,427.

Whilst the invention has been described as being applicable to the cartoning of cubes of meat extract it will be readily appreciated that the apparatus may be employed for cartoning other articles such as jellies or the like. Also, whilst reference has been made to articles of cube form it will be well seen that by suitably adapting the mechanism that articles of other shapes may equally well be cartoned by adjusting the sizes of the various parts of the mechanism. Again, articles having more than four sides may also be cartoned by increasing the number of folding blades or members employed at the first folding operation.

Electrical control means is preferably fitted to each machine so as to render the latter inoperative when the supply of cartons is exhausted or interrupted.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. A cartoning machine for enclosing articles of cube or oblong form in carton blanks, comprising an article-holding chute, means for advancing the said chute and article against a carton blank in the form of a cross comprising a center base with four side walls, a carrier for holding said blank in position below the chute, members operatively associated with said carrier for folding the side walls of said carton blank around the lower end of said chute, means for selectively withdrawing the chute from the top of the folded carton so as to leave the article therein, wiper means operative after the withdrawing movement of said chute adapted to completely fold the carton blank over the top of the article after the chute is withdrawn, and a plurality of wiper members adapted to move transversely and longitudinally across the top of the carton blank, to thereby fold over the top flaps of the blank which are provided at the outer ends of the side walls.

2. A carton machine for enclosing articles of cube or oblong form in carton blanks, comprising an article-holding chute, means for advancing the said chute and article against a carton blank in the form of a cross comprising a center base with four side walls, a carrier for holding said blank in position below the chute, means operatively associated with said carrier for folding the side walls of said carton blank around the lower end of said chute, means for selectively withdrawing the chute from the top of the folded carton so as to leave the article therein, a plurality of wiper members operative after the withdrawing movement of said chute adapted to move transversely and longitudinally across the top

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of the carton blank, to thereby fold over the flaps at the outer ends of the side walls of the blank over the top of the article, and heating means operable after actuation of the wiper members adapted to heat adhesive medium on the top flaps of each carton blank to seal the same.

3. A carton machine for enclosing articles in carton blanks, comprising an article-holding chute, means for advancing the said chute and article against a carton blank in the form of a cross comprising a center base with four side walls, a carrier for holding said blank in position below the chute, means operatively associated with said carrier for folding the said walls of said carton blank around the lower end of said chute, means for selectively withdrawing the chute from the top of the folded carton so as to leave the article therein, a plurality of wiper members operative after the withdrawing movement of said chute adapted to move transversely and longitudinally across the top of the carton blank, to thereby fold the flaps at the outer ends of the side walls of the blank over the top of the article, and heating means operable after actuation of the wiper members adapted to heat adhesive medium on the top flaps of each carton blank to seal the same, and a cooling presser plate leading to a point of discharge adapted to cool the sealed flaps of the carton after the wipers have been actuated.

4. A carton machine for enclosing articles of substantially cube form in carton blanks, comprising an article-holding chute, means for ad-

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vancing the said chute and article against a carton blank comprising two relatively narrow strips disposed at right angles in the form of a cross with upfolded flaps, a plurality of carrier members for holding the carton blanks, said carrier being formed from a rotor and each being so shaped and so proportioned as to hold said blanks in position to receive the articles, means for imparting intermittent rotation of the rotor to bring the said carriers successively into positions adjacent stations adapted to effect a particular operation of the carton blanks until the article is completely enclosed, and means for discharging the cartoned article operatively associated with the last station.

WILLIAM EWAN MACKENZIE.

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