Feb. 23, 1954 H. O. IRMSCHER 2,669,813

CARTON CONTENTS TAMPING AND SEALING APPARATUS

Filed Jan. 26, 1950 5 Sheets-Sheet 1

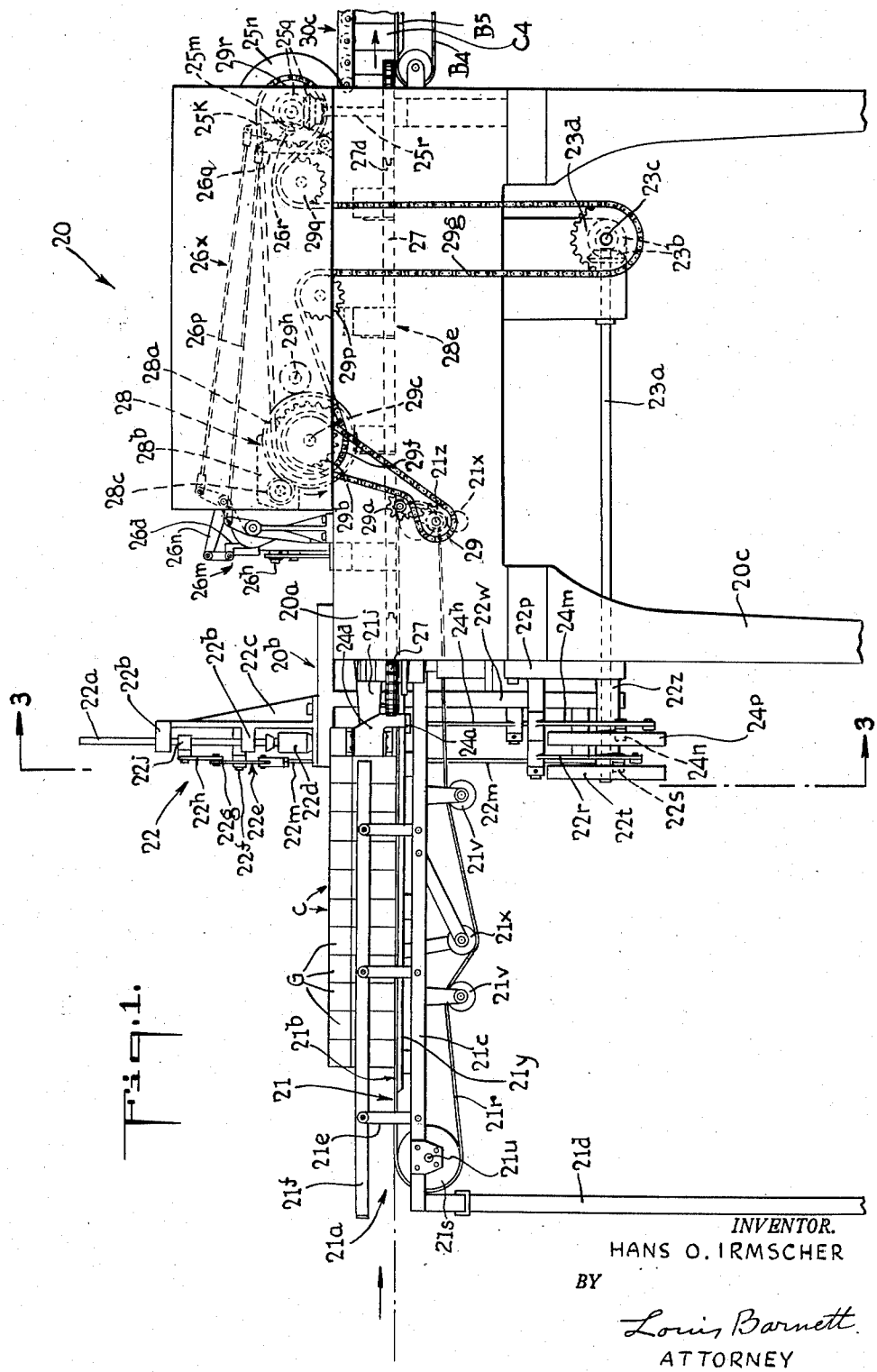


Fig. 1.

INVENTOR.
HANS O. IRMSCHER
BY
Louis Barnett
ATTORNEY

Feb. 23, 1954 H. O. IRMSCHER 2,669,813

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Filed Jan. 26, 1950 5 Sheets-Sheet 2

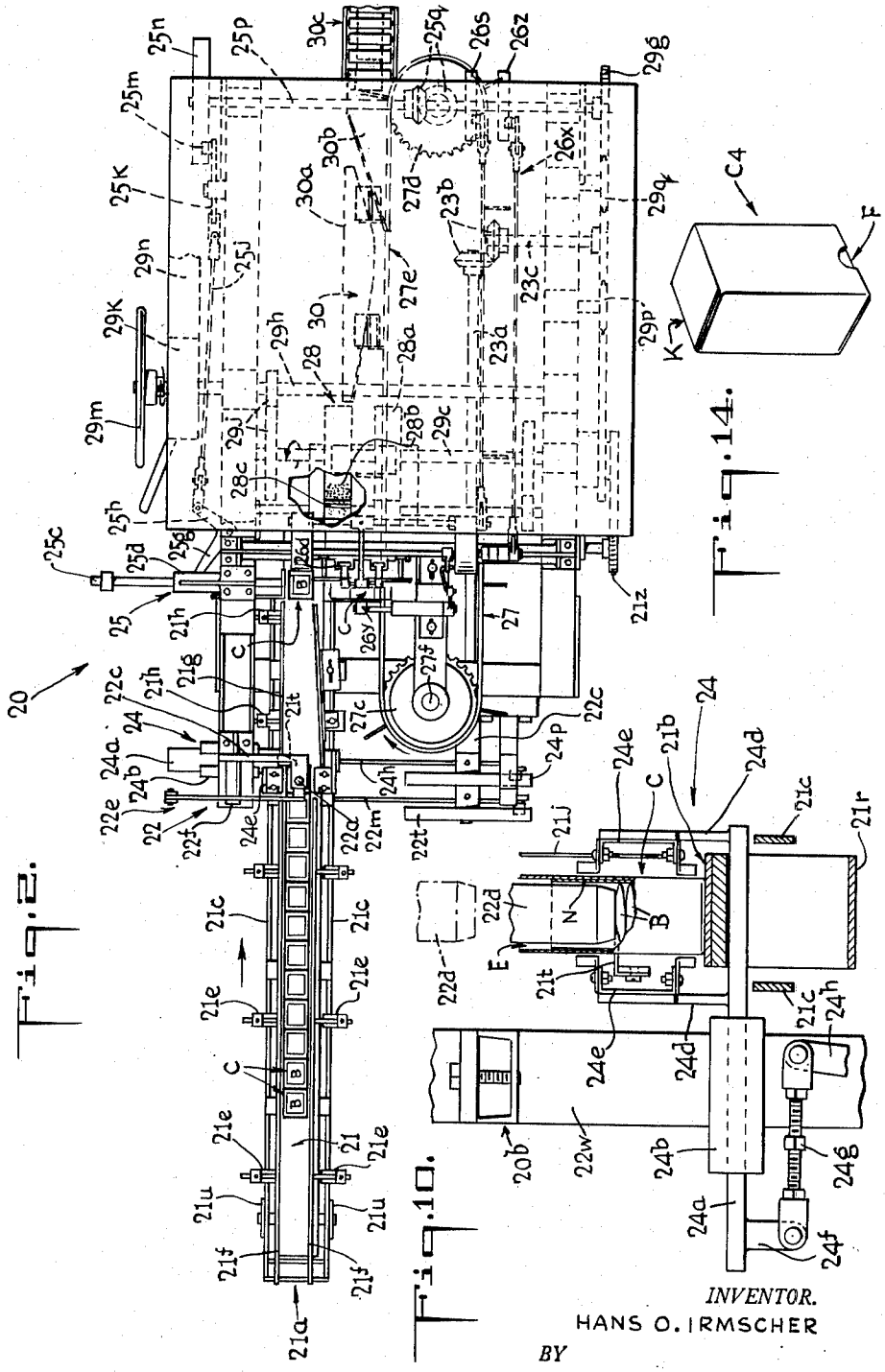


Fig. 2.

Fig. 14.

Fig. 10.

INVENTOR.
HANS O. IRMSCHER
BY
Louis Barnett
ATTORNEY

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CARTON CONTENTS TAMPING AND SEALING APPARATUS

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Fig. 9.

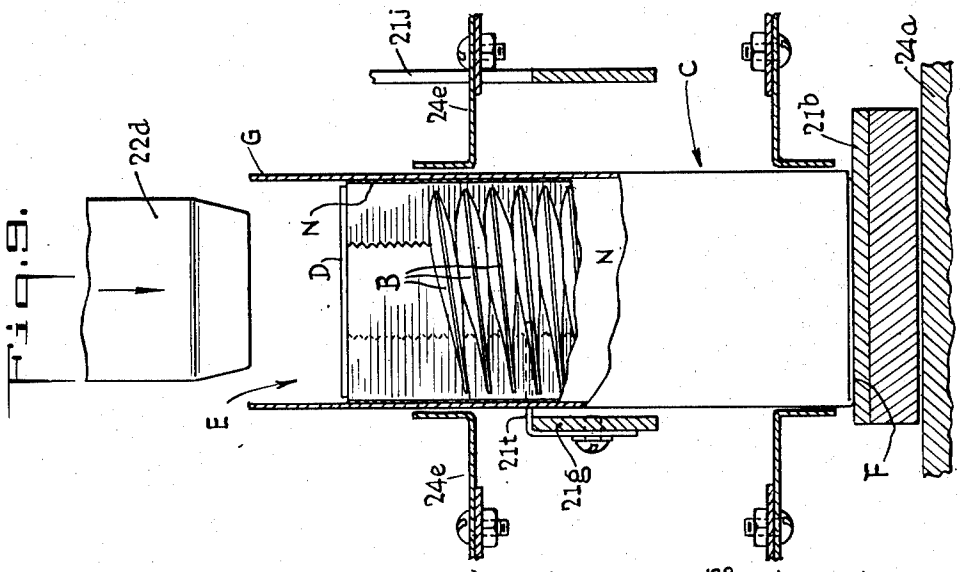
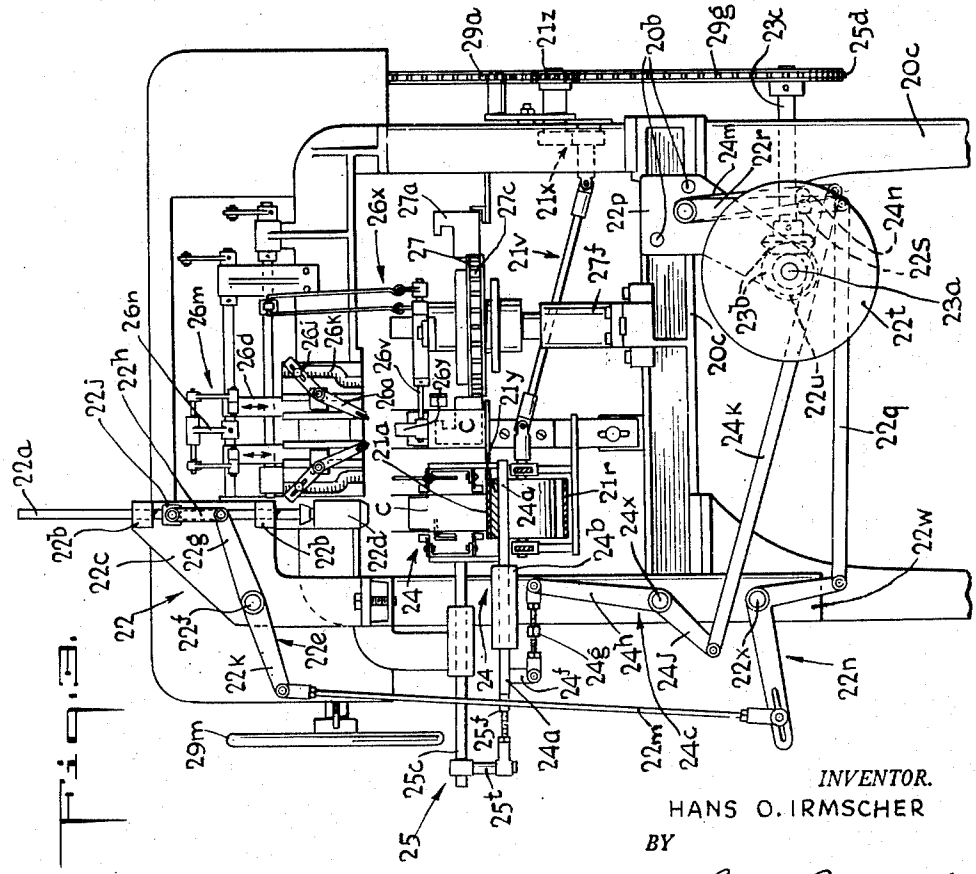


Fig. 10.



INVENTOR.
HANS O. IRMSCHER
BY
Louis Barnett
ATTORNEY

Feb. 23, 1954 H. O. IRMSCHER 2,669,813

CARTON CONTENTS TAMPING AND SEALING APPARATUS

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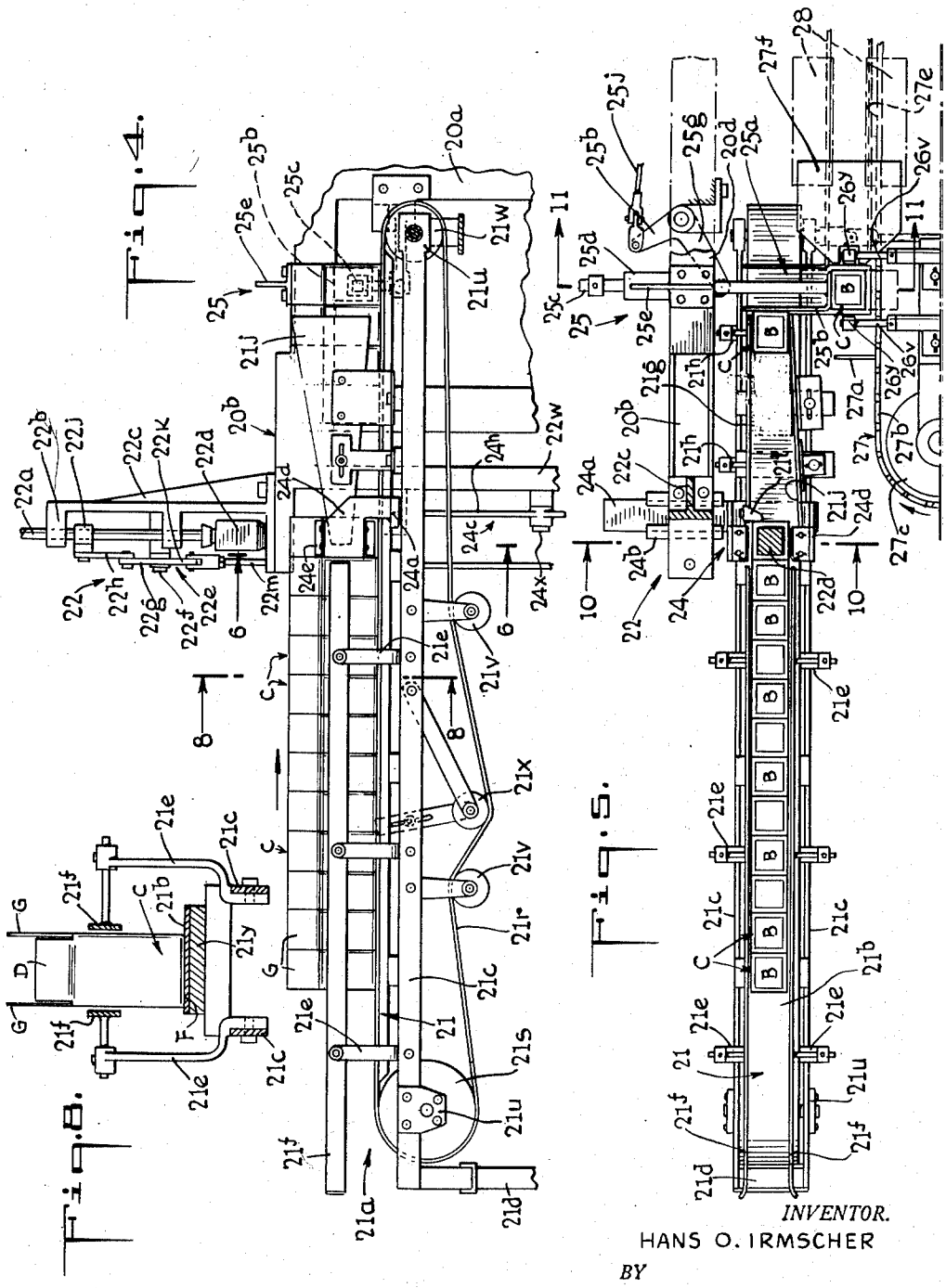


Fig. 4.

Fig. 8.

Fig. 5.

INVENTOR.
HANS O. IRMSCHER
BY
Louis Barnett
ATTORNEY

Feb. 23, 1954 H. O. IRMSCHER 2,669,813

CARTON CONTENTS TAMPING AND SEALING APPARATUS

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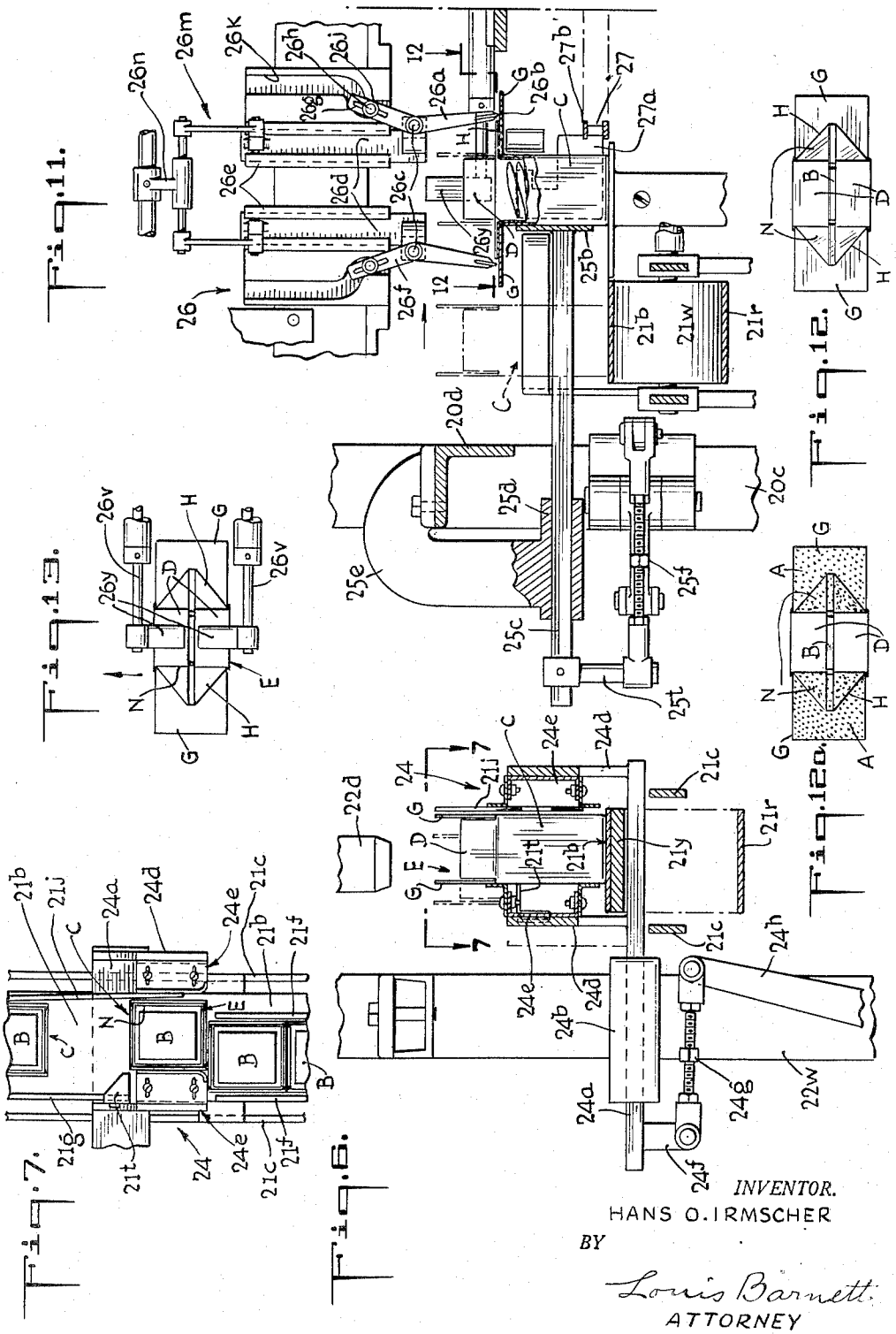


Fig. 11.

Fig. 12.

Fig. 12a.

Fig. 13.

Fig. 7.

Fig. 6.

INVENTOR.
HANS O. IRMSCHER
BY
Louis Barnett
ATTORNEY

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2,669,813

UNITED STATES PATENT OFFICE

2,669,813

CARTON CONTENTS TAMPING AND SEALING APPARATUS

Hans O. Irmscher, East Hempstead, N. Y., assignor to National Tea Packing Company, Inc., a corporation of New York

Application January 26, 1950, Serial No. 140,606

15 Claims. (Cl. 53—6)

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This invention relates to containers or carton packaging of articles in assembly-line fashion. More particularly the invention is directed to an apparatus of improved construction for tamping down the contents of a successive series of filled containers or cartons through an open end of each, and then folding and sealing said end while advancing on a conveying system for boxing and shipping as sealed packages, and an improved method of such packaging.

Among the objects of the invention is to generally improve packaging apparatus and method of the character described which apparatus shall comprise few and simple parts that are readily assembled to provide a compact construction, which shall form a station in an assembly-line packaging system for automatic operation and method to successively tamp and then fold and seal an end flap closure while the package advances toward a boxing and shipping station, which shall be reliable in operation, which can be readily incorporated in presently operating and newly constructed assembly-line article packaging systems, and which shall be practical and efficient to a high degree in use.

The application is a continuation in part of my copending application Ser. No. 132,448, filed December 12, 1949.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in steps of the method of manufacture and features of construction, combination of elements and arrangement of machine parts which will be exemplified in the method and construction hereinafter described and of which the scope of application will be indicated in the following claims.

Fig. 1 is a side elevational view showing a filled container contents tamping and end sealing apparatus installed to embody the invention in assembly-line fashion in portion of conveyor system.

Fig. 2 is a plan view of the apparatus and portion of the conveyor system shown in Fig. 1.

Fig. 3 is an end view of the apparatus shown in Figs. 1 and 2, as seen from lines 3—3 in Fig. 1.

Figs. 4 and 5 are enlarged fragmentary side elevational and plan views respectively of the container contents tamping means as shown in Fig. 1.

Figs. 6 and 7 are enlarged cross-sectional views taken on lines 6—6 in Fig. 4 and lines 7—7 in Fig. 6, respectively, showing details of the tamping means construction and operation.

Fig. 8 is a cross-sectional view taken on line

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8—8 in Fig. 4 across the conveying means showing the position of filled container prior to tamping the contents thereof.

Fig. 9 is an enlarged cross-sectional view showing the sealed package partly broken away after being acted on by the tamping and before final folding and sealing operation of the end flaps thereof.

Fig. 10 is a cross-sectional view taken on lines 10—10 in Fig. 5, showing the tamping device in effective position to press down the contents prior the fold and sealing, part of the container being broken away to expose the interior.

Fig. 11 is a cross-sectional view taken on lines 11—11 in Fig. 5 showing details of the end closure flaps of the package positioned for the closure operation after contents have been tamped down.

Fig. 12 is a top plane view of the filled carton showing a step in the operation of the folding apparatus taken from an effective position during the folding operation just after the step corresponding to that shown at lines 12—12 in Fig. 11.

Fig. 12*a* is a view similar to Fig. 12 showing the partially folded closure after adhesive has been provided.

Fig. 13 is a top plan view of the package and apparatus parts during the folding operation of the step shown in Fig. 12 prior to applying adhesive and sealing of the closure flap, and

Fig. 14 is a perspective view showing the finished package with the permanent seal end at the top and tucked in flap end at the bottom and in the relative position as it passes from the tamping and folding and sealing machine to be delivered for boxing and shipment.

Referring now to the drawing, 20 denotes an apparatus constructed to embody the invention for tamping down filling contents of a successive series of lined containers or cartons C through an open end E of each and then folding and sealing said end E while advancing on a conveying system, as for example, as shown, described and referred to in my said copending application Ser. No. 132,446 in assembly line-fashion to box and ship as seal cartons C4.

As shown in Figs. 1, 2, 4, 5 and 8, series of set up cartons C each having a lining N of sheet material therein, said carton C being formed with a tucked-in end bottom positioned closure F opposite said open top positioned end E, and having a filled contents, here shown as a predetermined number of manufactured articles, such as tea balls B, which are piled in superimposed relation within said lined open ended carton C. The latter may be advanced through carton receiving

end 21a of a suitable horizontally extending belt conveyor 21 of said apparatus 20, from a carton article filling station, (not shown) in the well understood manner as for example as fully disclosed and referred to in my said copending application. Mounted to upstand over said belt conveyor 21, at a spaced distance therealong from receiving end 21a, a suitable contents tamping mechanism 22 is provided which may include a vertically disposed plunger rod 22a mounted to reciprocate in spaced apart bearing 22b carried by offset bracket 22c secured to a rigid horizontal surface of extension 20b of frame 20a of apparatus 20.

Lower end of said rod 22a terminates in a plunger block 22d which may be shaped to correspond and loosely fit for sliding movement into a filled lining carton C aligned thereunder on conveyor 21, movement of said plunger block 22d, being from a raised clearance position over said carton C, shown in dot and dash lines as seen in Fig. 10, to that of a full line position thereof for tamping the stack of teaballs B in the lined carton C.

Reciprocating movement for said rod 22a may be provided through a double-ended lever 22e pivoted at 22f on bracket 22c having one end 22g of said lever 22e connecting with a suitable link 22h and clamp block 22j secured to said rod 22a between spaced bearings 22b as shown in Figs. 1, 3 and 4. End 21k of double lever 22e opposite end 22g connects through adjustable ended thrust bar 22m, with offset bell crank 22n pivoted at 22x to a down extended bracket portion 22w, reach rod 22q, and swing arm 22r, the latter carrying a roller 22s which rides in grooved disc plate cam 22t. Bracket member 22p on which arm 22r may be pivoted has an angular extension 22u, said bracket member 22p being secured to a frame cross member 20c of the apparatus frame by bolts 20b. Said bracket member extension 22u carries a bearing 22z for cross shaft 23a as is clear from Figs. 1, 2 and 3.

Cooperating with tamping operation of mechanism 22 for intermittently retaining filled cartons C against movement with conveyor belt 21 when aligned under said plunger block 22d, and for externally supporting said carton C during said tamping operation, particularly when the plunger block 22d extends into and is retracted from the interior of the carton C, there may be provided an interposing barrier 21t and a releasably slideable gateway 24 having a horizontally disposed base bar 24a which extends across conveyor belt 21 under the upper or carrier horizontal extending side 21b thereof. Said base bar 24a reciprocates in a sleeve bearing 24b secured and supported from said down extending bracket portion 22w, as is clear from Figs. 5, 6 and 10, and has at one end thereof upstanding stanchions 24d spaced apart on opposite sides of the conveyor belt 21b. Said stanchions 24d each supports a push plate member 24e which may be adjustably mounted on said stanchions 24d to accommodate cartons of various cross sectional dimensions. For reciprocating said bar 24a with push plate members 24e, the other end of base bar 24a may be provided to have extending vertically down therefrom, a pivotal lug 24f which has swingably connected therewith a nut end of a distance adjusting screw 24g, the other nut end of the latter pivotally connecting with an upwardly extending arm 24h of a rock lever 24c. A downwardly extending arm 24j of said rock lever 24c which may be pivoted at 24x on said bracket portion 22w may connect with reach rod 24k which connects with swing arm 24m that carries a roller 24n, the latter riding in a groove of disc cam plate 24p, the latter being mounted to turn with cross shaft 23a alongside disc plate cam 22t as shown in Figs. 1 and 3.

As seen from Figs. 1, 2 and 4, conveyor 21 may be constructed with supporting side rails 21c which extend horizontally on opposite sides therealong just below the level of carrier belt portion 21a, said rails 21c being firmly secured at the required elevation by suitable outer upright end struts 21d spaced from the frame 20a, and at said frame 20a. Spaced apart to upstand along each of said rails 21c from the conveyor receiving end 21a to the tamping mechanism 22 are offsetted posts 21e, which may support parallelly aligned space adjustable guide fence 21f for side directing the filled cartons C along with conveyor belt carrier portion 21a. Just short of said gateway 24, fence 21f terminates, and as seen from Figs. 2 and 4, on the upper or far side of conveyor 21, an adjustable fence section 21g on offsetting posts 21h may be provided, while on the lower or near side, a companion deflecting plate section fence 21j is adjustably mounted.

To improve the tamping operation, there may be provided between base bar 24a but clear thereof and the upper horizontally extending conveyor belt 21b a suitable stationary support 21y over which said conveyor belt 21b rides and which is rigidly secured so as to take the impact of the plunger block 22b on the tea bags B in each carton C, as is clear from Figs. 3 and 6.

Said fence section 21g and companion deflecting fence plate 21j are relatively short and extend closely to a carton transfer which communicate with carton top end E folding, and sealing mechanism 25 for completing the closures of cartons C to form finished packages in form of cartons C4 ready for boxing and shipment in the manner hereinafter described.

As seen from Figs. 4 and 5, conveyor 21 extends from the receiving end 21a thereof at tail pulley 21s thereof to just beyond mechanism 25 at head pulley 21w of said conveyor 21. Both pulleys 21s and 21w may be supported in suitable bearings 21u from side rails 21c, the under or lower portions 21r of the conveyor belt 21 being supported to ride on suitable idler pulleys 21v and against a belt slack take-up pulley 21x, said pulleys 21v and 21x also being supported from side rails 21c as shown in Fig. 4.

Each filled carton C as it is advanced to tamping mechanism 22 is first brought to full stop over said base bar 24a by said interposing barrier 21t which is mounted on fence section 21g in the direct path of the advancing cartons C on conveyor belt 21b, and after the tamping operation is completed and plunger block 22d fully raised free from the carton open end E, gateway 24 slidingly displaces the carton C aligned therewith and against barrier 21t to move transversely said advancing path against said deflecting plate section fence 21j, that is, free from barrier 21t, thereby permitting the tamped carton C to be gradually returned to the path of the belt conveyor 21 for continuing the advance movement of carton C on reaching said mechanism 25 as is clear from Fig. 5.

As seen from Figs. 2, 5 and 11, each tamped filled carton C at mechanism 25 enters a transfer cross slideway passage 25a located at the head end of conveyor 21, in which passage 25a, a push plate 25b reciprocates transversely of the path of

movement of tamped filled carton C, said push plate 25b being mounted to move with one end of horizontally extending thrust-rod 25c, which may be supported for reciprocation in a sleeve bearing 25d, the latter being firmly secured by bolted depending bracket 25e on a cross-frame angle-bar 20d. The other end of thrust rod 25c may through connection fitting 25t and a length adjusting screw 25f connect with one arm 25g of a bell crank, the other arm 25h being rocked through movement of a reach-rod 25j connecting with a rock lever 25k which carries a roller 25m riding in a groove of a disc plate cam 25n as shown in Fig. 2, the disc plate cam 25n being mounted to turn with horizontal cross transmission shaft 25p which may through meshing bevel gearing 25q be driven from vertical counter shaft 25r, as shown in Fig. 1.

Each tamped filled carton C after being transferred by movement of push plate 25b along slideway passage 25a laterally with respect to the advancing path thereof is projected to align under top end folder 26 which as seen in Fig. 11 may include a pair of vertically mounted coacting lever members spaced apart so that downwardly extending portions 26a thereof which carry wipers 26b, engage and fold oppositely positioned large flaps G of carton open end E to extend outwardly at substantially horizontal level.

Said lever members may be pivoted at midportions 26c thereof on slide shoes 26d which ride in spaced apart vertically disposed parallelly aligned, trackways 26e. Upwardly extending end 26f of said lever member opposite said portions 26a may be slotted as at 26g wherethrough pin ends 26h of rollers 26j pass, the latter riding in cam slots 26k which extend alongside trackways 26e.

Shoes 26d carrying said lever member reciprocate vertically in unison over carton C so that wipers 26b on descent movement of said lever member is first inserted into the carton open end E, while the flaps G are still upstanding as shown in dot and dash lines in Fig. 11, after which upper corner end H of lining N are folded down and creased simultaneously with the outfolding of flaps G by down and outward movement of said lever member wiper 26b.

As seen from Figs. 1 and 11, reciprocation of the slide shoes 26d with said lever members may be accomplished by an interconnected suitable linkage, such as double link 26m, rock lever 26n, reach-rod 26p and bell crank 26q which carries a roller 26r riding in a groove of a disc cam plate 26s, the latter being mounted to turn with cam shaft 25p.

While flaps G are outfolded, as described above and shown in Fig. 12, cooperating spaced finger pieces 26y, which are positioned to align with vertically extending smaller cross flaps D at carton top end E, are rotated with spindles 26v from the unfolded position shown in Fig. 11 to the down folded position shown in Fig. 13.

For rotating spindles 26v in proper timed relation another linkage, indicated generally 26x, similar to that described above for actuating said lever members which fold flaps G, may be provided, said last mentioned linkage 26x interconnecting with disc cam-plate 26z is mounted alongside disc cam-plate 26s to turn with cam-shaft 25p, as is clear from Figs. 1 and 2.

After said folding operations of said flaps D and G, spindles 26v, the top end folded carton C, is moved to advance by one of a series of spaced apart vertically positioned flight plates 27a of a horizontally disposed endless chain conveyor 27.

As seen from Figs. 2, 3, 5 and 11, gateway 24 serves a transfer intercommunicating means between the advancing path of movement of carton C on conveyor 21 with the path of movement thereof by endless chain conveyor 27. Flight plates 27a, carried by chain links 27b of conveyor 27, and are so spaced apart for movement in timed relation to advance each carton C just after the above folding of flaps D and G has been completed by folder 26.

Chain links 27b of endless conveyor 27 pass around tail sprocket wheel 27c and head sprocket wheel 27d spaced therefrom, the latter receiving power to drive conveyor 27 from gearing 25q and shaft 25r, said sprocket wheels 27c and 27d being suitably mounted from the apparatus frame 20a in their respective shaft bearings 27f.

As seen in Figs. 5 and 11, each carton C after having the flaps D and F down folded by the top end folder 26 as described above to the form shown in Fig. 12 is pushed by flight plate 27a to advance along a path in a direction of the length of the side 27e of endless conveyor 27 in alignment with the position of the carton C during said flap folding operation by top end folder 26.

Said flaps D and G after being folded as shown in Fig. 12, the carton is advanced by conveyor 27 and immediately passes directly under horizontally positioned flat plate 27f which serves to retain said flaps D infolded and flaps G outfolded to guide the latter to enter a suitable adhesive applying means 28, such for example as glue rolls 28a which receive liquid glue on the peripheral surface thereof from fount 28b. Said rolls 28a being conditioned for applying the proper amount of adhesive by doctor rollers 28c riding on said rolls 28a, and shown in Figs. 1, 2 and 5.

Rolls 28a may be rotated with said shaft 29c, and are spaced apart to apply adhesive coating A from an under portion thereof on upturned lining folds N and outfolded flaps G as shown in Fig. 12a, being provided a pressure supporting means 28e carried by adjacent portion of the frame 20a which extends under rolls 28a on which the underside of said flaps G rides when applying said adhesive coating A, as shown in Fig. 1.

As seen in Fig. 1, said shaft 29c which has mounted to turn therewith both adhesive applying rolls 28a and sprocket wheel 29b also has driven sprocket wheel 29f for an interconnecting drive chain 29g, said shaft 29c receiving power from main shaft 29h through meshing gears 29j, a suitable clutch 29k, hand wheel 29m, and motor belt drive 29n being provided for apparatus 20 at the far or front side as seen in Fig. 2.

Interconnecting drive chain 29g which is turned by said sprocket wheel 29f on shaft 29c passes over sprocket idler 29p and sprocket 23d which as seen from Figs. 1 and 2 turns said shaft 23c and through said bevel gearing 23b drives cross shaft 23a for operating in timed relation tamping mechanism 22 and transferring of the carton C in gateway 24 through disc cam plates 22t and 24p, respectively, mounted to turn with shaft 23a as heretofore described. Said drive chain 29g also passes over another sprocket idler 29g spaced from said idler 29p and under drive sprocket 29r which turns cam shaft 25p on which disc cam plates 25g, 26s and 25n which refold flaps D and G into final sealed closure position.

Head pulley 21w of conveyor 21, may be driven through a suitable universal jointed shaft 21v,

meshing gear 21x and a sprocket 21z which meshes with an intermediate chain drive 29 having a slack take-up idler sprocket 29a all mounted from frame 20a, chain drive 29 in turn being driven through sprocket wheel 29b mounted to turn with cross shaft 29c, as is clear from Figs. 1, 2 and 3.

Carton C with the flaps D infolded and outfolded flaps G adhesive coated are continuously advanced along by conveyor 27 to pass through suitable flap closure means 30 of any well understood construction, such as deflector blades 30a and 30b which refold flaps G first one and then the other in superimposed layers with adhesive coating H to make an adhesively sealed end closure K, for completed carton C4 as shown in Fig. 14. Pressure rollers 30c over the remaining path of travel of carton C4 along conveyor 27 may be provided, said carton C4 being discharged from apparatus 20, if desired by a continuing belt conveyor B4 having a top belt portion B5 thereof cooperating with pressure rollers 30c between which carton C4 rides for delivery for boxing and shipping in any well understood manner.

From the construction and assembly of apparatus 20 as described above and shown in the drawings the operation thereof and the utility of the invention will be readily understood, particularly the feature of the improved contents tamping mechanism 22 arranged to operate in timed relation with the operation of conveyor 21 and the subsequent folding and sealing of top open ends E of lined filled cartons C.

Thus as seen from Figs. 2, 5 and 8, said cartons C are supplied from receiving conveyor end 21a in assembly-line fashion, as for example, in the manner shown and described in my said copending application, and are brought into a first abutment row or series by the movement of conveyor belt 21b on which said series abutting cartons C ride. As the leading carton C of said first series reaches in underneath alignment with the plunger block 22d, as shown in Fig. 1 and in Fig. 6 in dot and dash lines, said carton C is held against advancing movement with conveyor belt 21b by stop barrier 21t. The various operational steps of apparatus 20 are so timed by the interconnected power drives and cams above described to cause plunger block 22d to descend from its fully raised position and is in registered alignment so as to permit entry into said carton C for tamping the contents thereof, that is, to compress the superimposed tea balls B so that the latter will not interfere with the subsequent folding and sealing operations to provide said closure K. The full descent of plunger block 22d into carton C with the latter immobilized is shown in Fig. 10, the withdrawal of said plunger block 22d leaving said contents well below the level of final closure K as is clear from Fig. 9.

As seen from Fig. 3 actuation of plunger block 22d with rod 22a takes place through an interconnecting linkage described above of lever 22e, thrust bar 22m, crank 22n, reach rod 22q, swing arm 22r, and disc cam plate 22t which rotates with shaft 23a as described above.

It has been found that over 30 per minute tamping operations can be carried out with the improved apparatus 20 thereby affording an efficient and overall relatively high capacity output for apparatus 20.

When the plunger block 22d returns to its fully raised position clear of the carton C, plate members 24e in gateway 24 slide the carton C transverse the direction of travel of belt portion 21b, so that, the carton C by-passes stop barrier 21t and as is clear from Figs. 6 and 7. Said plate members 24e with stanchion 24d are reciprocated through said bar 24a and an interconnecting linkage formed by adjusting the screw 24g, rock lever 24e, reach rod 24k, swing arm 24m, and disc cam plate 24p which, as described above, rotates with shaft 23a, and is clear from Fig. 1.

As carton C is moved into said by-passing, that is, in offset relation with respect to the path of travel of belt portion 21b, as shown in Figs. 6 and 7, and past the stop barrier 21t, the advanced movement of said belt portion 21b carries carton C against fence plate 21j for deflecting same as it advances fully back into the path of travel of belt portion 21b until it reaches the slideway passage 25a of the sealing mechanism 25. Here the push plate 25b, as shown in Figs. 2, 4 and 5, moves the carton C transversely along slideway passage 25a until carton C is positioned in alignment under end folder 26 as shown in Figs. 3 and 11.

Push plate 25b is actuated with the sliding movement of thrust bar 25c and interconnecting linkage provided by adjusting screw 25f, belt crank arms 25g and 25h, reach rod 25j, rock lever 25k, and disc cam plate 25m mounted to rotate with shaft 25p as seen from Fig. 2. Carton C as it comes to rest under end folder 26, has the flaps G and D outfolded and infolded, respectively, and as has been described above and as shown in Figs. 11, 12 and 13, has adhesive A applied thereto by glue rollers 28a. Finally, flaps G are alternately folded over in superimposed relation to form sealed closure K delivered for boxing and shipping on conveyor B4 as shown in Fig. 1, the carton C being conveyed in proper timed relation by flight 27a of chain conveyor 27.

All the individual operational steps of apparatus 20 are carried out consecutively on each carton C but concomitantly on a successive series thereof as has already been described, driving power being supplied through transmission shaft 29h, meshed gears 29j, shaft 29c and chain drives 29 and 29g. The conveyor 21 is driven through universal jointed shaft 21v, as shown in Fig. 3, and the end folder 26, adhesive applying means 28 and drive shafts 23a and 25p driven in the manner already described and as shown in Figs. 1 and 2.

With a supply of cartons C directed to conveyor 21, by turning of the hand wheel 29m, through clutch 29k, power from motor belt drive 29n can selectively be either connected or disconnected as required for the practical operation of apparatus 20.

It will thus be seen that there is provided an improved apparatus and method in which the several objects of the invention are achieved and which are well adapted to meet the conditions of practical use.

As various possible embodiments of the invention may be made in the above invention and as various changes may be made in the embodiment above set forth, it is to be understood that all matters herein set forth and shown in the accompanying drawing are to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention I claim as new and desire to secure by Letters Patent:

1. In a method of forming sealed end closures on open-ended cartons filled with articles, the steps of continuously advancing a series of said filled cartons with the open ends up along a path in a first direction, stopping said advance-

ment of each carton against a single fixed barrier projecting in said path for bringing said series into direct abutment relation of all filled cartons, tamping the carton contents while each carton is in a relatively stationary position against said barrier in said path during one time interval, moving each tamped carton of said series a distance out of said path transversely of said first direction, by-passing the projecting fixed barrer and returning of each tamped carton to continue advancement in said path, transferring each tamped carton transversely said first direction to another path in a second direction, and concurrently with said tamping step folding and adhesively sealing flaps at each of said carton open ends of a preceding carton to provide a completely closed carton in form for boxing and shipping.

2. In a method of forming sealed end closures on open ended cartons filled with article contents, the steps of continuously advancing a series of said filled cartons with the open ends up along a path in a first direction, stopping said advancement of each carton against a fixed barrier projecting in said path for bringing said series into direct abutment relation of all filled cartons, tamping the carton contents while each leading carton of said abutting series is relatively stationary in said stopped advancement, and then moving the tamped carton out of said path transversely of said first direction to by-pass said fixed barrier and to continue the advancing movement thereof in a direction for returning the tamped carton to said path.

3. In a method of forming sealed end closures on open ended cartons filled with article contents, the steps of continuously advancing a series of said filled cartons from direct abutment relation positions of all filled cartons with the open ends up along a path in a first direction, tamping the contents of each leading carton of said abutting series while retaining same relatively stationary against said advancement while all of said cartons continue in abutment, and then moving the tamped carton out of said path transversely of said first direction to free the same from said retention to continue the advancing movement thereof in said first direction in said path.

4. A method as defined in claim 1 in which the step of transferring each tamped carton takes place concurrently with said moving of a following carton in by-passing said fixed projecting barrier.

5. An apparatus of the character described comprising an elongated conveyor means for advancing a series of open-ended cartons filled with article contents along a path in one direction, a relatively fixed barrier positioned to project into said path against which a leading carton abuts for stopping said series advancement thereof, means for tamping down the content of each leading carton during said stoppage while relatively stationary against said fixed barrier, and a reciprocating gateway for sliding each tamped carton out of said path transversely of said direction beyond and free of the fixed barrier to continue in the direction of advancing movement and to return the sliding tamped carton to said path.

6. An apparatus of the character described comprising an elongated conveyor means for advancing a series of open ended cartons filled with article contents along a path in one direction, tamping means positioned in the path of

movement of said carton on the conveyor means, a fixed barrier projecting into said path located forwardly with respect to said tamping means to interrupt the advancing movement for retaining a leading carton in alignment with said tamping means and said series in abutment, and means for deflecting said tamped cartons after each retention thereof to detour said barrier and proceed along said path.

7. An apparatus of the character described comprising an elongated conveyor means for advancing a series of open-ended cartons filled with article contents along a path in one direction, an endless elongated conveyor having a transfer passageway, a push plate reciprocably mounted on said passageway for slidingly moving cartons from said conveyor means to the endless conveyor, tamping means positioned in the path of movement of said carton on the conveyor means, a fixed barrier projecting into said path located forwardly with respect to said tamping means to interrupt the advancing movement for retaining a leading carton in alignment with said tamping means and said series in abutment, means for deflecting said tamped cartons after each retention thereof to detour said barrier, and means to intermittently actuate said deflector means in predetermined relation with respect to the reciprocation of said push plate transfer.

8. An apparatus as defined in claim 5 in which said conveyor means includes a transfer passageway along a head portion thereof, a pusher reciprocably mounted in said passageway for sliding each tamped carton from said conveyor to a carton end closure sealing mechanism, and cam controlled linkage for actuating said tamping means, gateway and pusher in predetermined timed relation.

9. An apparatus as defined in claim 6 which includes a power drive for said conveyor means and for actuating said tamping and deflecting means in predetermined timed relation.

10. In an apparatus of the character described a horizontally disposed belt conveyor for advancing a series of open-ended cartons filled with article contents along a path in one direction having a fixed barrier projecting into said path against which a leading carton abuts for a stopping period, a tamping block mounted for vertical reciprocation over said conveyor in registered alignment with said leading carton during said stopping period, a horizontally disposed gateway communicating with said conveyor adjacent said barrier for sliding each carton out of said path transversely of said direction beyond and free of said barrier after completing the tamping of said article contents by the block, and a deflecting fence plate extending alongside said conveyor opposite said barrier and gateway for returning each carton after said sliding to said advancing direction of said conveyor.

11. In an apparatus as defined in claim 10 which includes a plunger rod on an end of which said block is carried, and cam power-drive control means connecting with said gateway and with plunger rod and block in timed operational relation.

12. In an apparatus as defined in claim 10, which includes a horizontally disposed slideway passage communicating with said conveyor spaced in an advanced position with respect to said tamping block and gateway, a bar terminated by a push plate reciprocatingly mounted in said slideway passage for transferring each tamped carton from said belt conveyor to a top

end closure sealing mechanism, and cam control means connecting with each of said tamping block, gateway and bar for operation in timed relation.

13. In an apparatus as defined in claim 10 which includes a plunger rod on an end of which said block is carried, a horizontally disposed slideway passage communicating with said conveyor spaced in an advanced position with respect to said tamping block and gateway, a bar terminated by a push plate reciprocatingly mounted in slideway passage for transferring each tamped carton from said belt conveyor to a top end sealing mechanism, and cam control power-drive means connecting with each of said plunger rod, gateway and bar for operation in timed relation.

14. In an apparatus of the character described a horizontally disposed belt conveyor for advancing a series of open-ended cartons filled with article contents along a path in one direction having a fixed barrier projecting into said path against which a leading carton abuts for a stopping period, a tamping block mounted for vertical reciprocation over said conveyor in registered alignment with said leading carton during said stopping period, a horizontally disposed gateway communicating with said conveyor adjacent said barrier, reciprocating means for sliding said gateway with each carton out of said path transversely of said direction beyond and free of said barrier, cam power-drive means for actuating said block and gate reciprocating means in timed relation for completing the tamping of said article contents by the block before said gate reciprocating means becomes effective to slide said gateway and carton transversely free of said barrier, and a fixed deflecting fence plate extending alongside said conveyor opposite said barrier and gateway for guiding each carton after said transverse sliding to return to said advancing direction of said conveyor.

15. An apparatus of the character described comprising a horizontally disposed belt conveyor for advancing a series of open-ended cartons

filled with article contents along a path in one direction having a fixed barrier projecting into said path against which a leading carton abuts for a stopping period, a plunger rod mounted for vertical reciprocation over said conveyor, a tamping block terminating said rod positioned in registered alignment with said leading carton during said stopping period, a horizontally disposed gateway communicating with said conveyor adjacent said barrier, reciprocating means for sliding said gateway with each carton out of said path transversely of said direction beyond and free of said barrier, cam power-drive means for actuating said rod and gate reciprocating means in timed relation for completing the tamping of said article contents by the block before said gate reciprocating means becomes effective to slide said gateway and carton transversely free of said barrier, a fixed deflecting fence plate extending alongside said conveyor opposite said barrier and gateway for guiding each carton after said transverse sliding to return to said advancing direction of said conveyor, a horizontally extending transfer passageway communicating with a head portion of said conveyor at a spaced distance from said barrier, a pusher reciprocably mounted in said passageway for sliding each tamped carton returned by said deflecting fence plate from said conveyor head portion to a carton end closure sealing mechanism, and cam power-drive means for actuating said pusher in timed relation with said first mentioned cam power-drive means.

HANS O. IRMSCHER.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
646,355	Butler et al.	Mar. 27, 1900
1,198,740	Martin	Sept. 19, 1916
1,320,038	De Escobales	Oct. 28, 1919
1,991,656	Campbell	Feb. 19, 1935
2,068,242	Maxwell	Jan. 19, 1937
2,369,575	Kay	Feb. 13, 1945
2,464,099	Ross	Mar. 8, 1949