Sept. 7, 1926. 1,599,155

W. A. WEIGHTMAN ET AL

MECHANISM FOR ASSOCIATING ARTICLES AND BLANKS

Original Filed Sept. 15, 1922 2 Sheets-Sheet 1

Fig. 1.

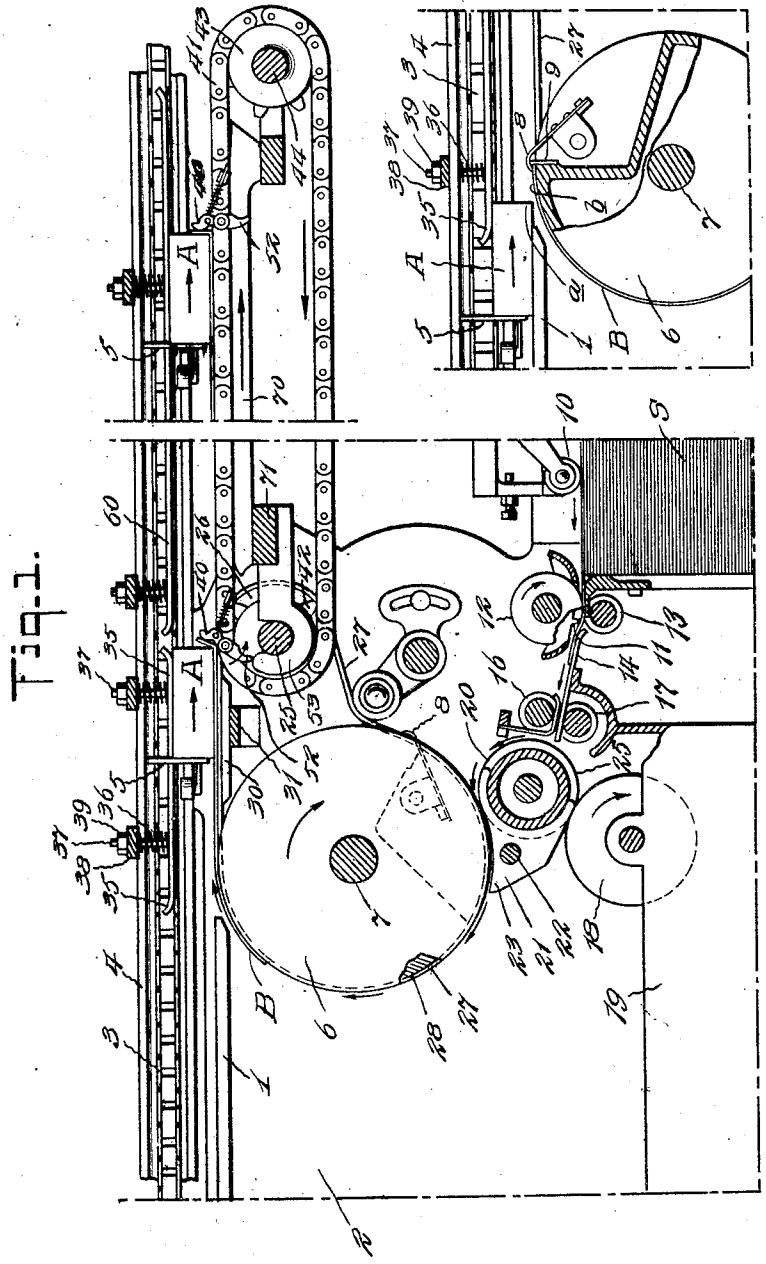


Fig. 1a.

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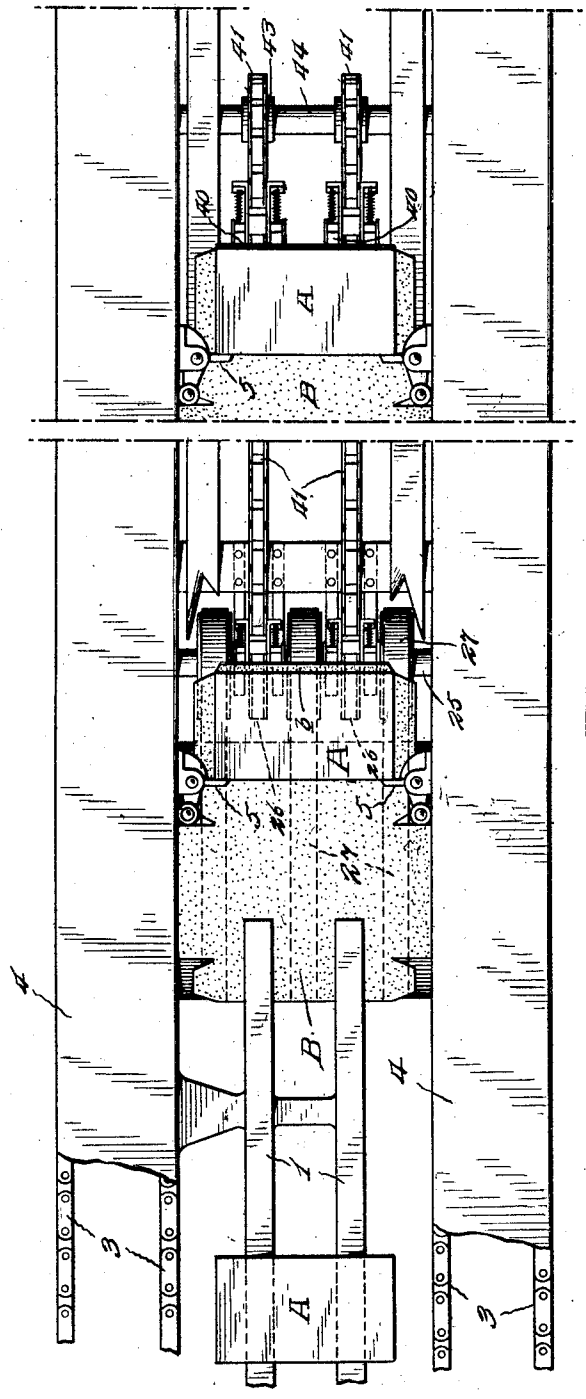


Fig. 2.

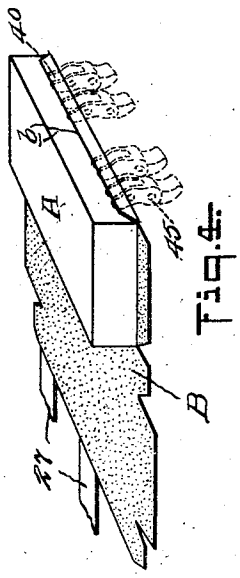


Fig. 4.

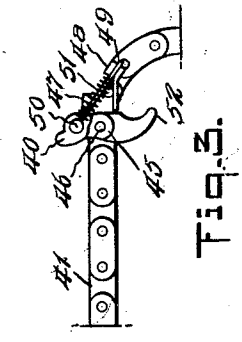


Fig. 3.

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UNITED STATES PATENT OFFICE.

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MECHANISM FOR ASSOCIATING ARTICLES AND BLANKS.

Original application filed September 15, 1922, Serial No. 588,354. Divided and this application filed November 15, 1923. Serial No. 674,884.

This application is a division of our previous application, Serial No. 588,354, filed September 15th, 1922, and relates to the mechanism therein disclosed for handling articles, here represented by boxes or cartons, and flexible sheets, here represented by wrapper sheets, and especially for conveying the associated articles and sheets and manipulating projecting sheet portions as hereafter fully explained.

The characteristics and advantages of the present invention are further sufficiently explained in connection with the following detail description of the accompanying drawing, which show certain exemplifying embodiments of the invention. After considering these, persons skilled in the art will understand that many variations may be made within the principles of the invention, and we contemplate the employment of any structures that are properly within the scope of the appended claims.

Figure 1 is a vertical, longitudinal section of mechanism embodying the invention in one form.

Figure 1A is a fragmentary positional view.

Figure 2 is a top plan.

Figure 3 is a detail of a part of one of the assembly conveyor chains and blank folding and pressing fingers thereon.

Figure 4 is a prospective view of an associated blank and article, explaining the blank margin turning or folding and pressing operation.

In the present embodiment of the invention the articles handled are sufficiently represented by the boxes or cartons A, and the blanks are sufficiently represented by the specially cut wrapper blanks B, which are intended to be completely wrapped or folded about the carton with interposed adhesive to form a sealed, wrapped package. The blanks may vary greatly and in some cases may be labels instead of wrappers. The present invention relates only to the handling or advancing of successive articles and blanks, bringing them together in proper relative positions to form what we call assemblies, maintaining the assemblies (each consisting of an article and label) in proper relative positions while they are moved away from the point of assembly contact, and very quickly turning or folding a projecting portion of the blank and adhesively securing it against an adjacent face of the article to further positively secure the blank and article in the proper relative positions. The assemblies may then be disposed of in any suitable way, for instance, in the case of a wrapping machine, they may be delivered to wrapping mechanism which completes the folding of the wrapper about the article, or the assemblies may be otherwise treated, depending on the nature of the article and the blank.

The articles A are advanced in spaced relation over supports or rails 1 supported from any suitable side frames such as 2, the framing of the machine not being particularly illustrated. Conveying devices for advancing the article may vary considerably but such conveying means consists in the present instance of chains 3 running on horizontal sprockets (not shown) under guard plates 4. The chains carry pushers 5 at regular intervals, these pushers being arranged to engage a rearward face of an article near its ends. The construction and arrangement of the conveyor chains and pushers are described in detail in the parent application above mentioned. Below the line of article advance a rotary blank platen 6 is mounted on the shaft 7. This platen has movable grippers 8 adjacent to blank stops 9. The grippers are operated by any suitable means, such as well known cam mechanism.

In the broader aspect of the invention any known or suitable means may be provided for advancing individual blanks in proper relation to the article movement, and for adhesively conditioning the blanks. Such mechanism should include means for accurately registering or positioning the blanks to insure their association with the article in the proper relative positions. In the present specific example the blanks are advanced from a stack S by any suitable feed mechanism including a pusher roll 10, and the forward edge of each blank is brought against a stop 11 between feed rolls 12 and 13, and the blank is slightly buckled to insure the proper location of its forward edge against the stops, feed roll 13 is then raised to positively grip and advance the blank over a

shelf 14 to a glue roll 15. Desirably, the advancing blanks are engaged and positively fed by another pair of feed rolls 16 and 17 adjacent to the glue roll. The glue roll is supplied with glue by a dipper roll 18 from a glue pot 19. The glue roll is adjacent to the lower surface of the blank platen, and is provided with annular channels 20, in which are located segments or stripper blades 21 mounted on a rod 22, the stripper blades also having part-circular segments 23, closely adjacent the lower surface of the platen. The blank feeding and gluing mechanism is more particularly described in the parent application above identified. Adjacent to the platen is a shaft 25 carrying a plurality of pulleys 26 and assembly conveying belts 27 run over these pulleys and around the blank platen 6, being accommodated in shallow channels 28 therein.

As the platen grippers 8 approach a point below shaft 7, they are open, and previous to that time an individual blank has been advanced from stack S against stops 11, and advanced by the feed rolls 12 and 13, 16 and 17; the forward portion of the blank is diverted upward and the blank passes over the glued surface of the glue roll 15, and its forward edge is brought against the blank stops 9, on the platen and is then gripped by the grippers 8, which close as the platen advances slightly beyond the stated position. The article pushers 5 are so positioned on the chains 3, that when the forward edge of the blank is brought around by the platen to the uppermost position, as shown in Figure 1A, an article A, moving at the same speed as the surface speed of the platen, is brought into proximity to the glued blank surface, with a forward edge or corner *a* of the article adjacent to a part of the blank some distance rearward of the forward blank edge. The article and blank are now brought in contact with a portion *b* of the blank, usually a marginal portion of substantial width (in the direction of assembly movement) projecting beyond the article. In this movement of the assembly it is supported on the upper stretches of conveyor belts 27, the blank resting on the belts and the article resting on the blank, and the upper belt stretches are additionally supported by rails or plates 30, which are carried by a frame member 31. Where long wrapper blanks are employed, as in the present specific instance, a long portion of the blank trails behind the article. To definitely retain the article in the proper registered position on the blank, at or just before the moment of assembly contact the article is brought beneath the upper presser bars or rails 35, which are yieldingly urged downward by springs 36 surrounding stems 37 which support the blades, these stems passing through transverse supporting members 38, and stops in the form of nuts 39 being provided on the stems to limit the downward movement of the presser bars. In this way the blanks are definitely registered in relation to the article movement and the articles and blanks are brought togeher in proper registered positions, and are retained in the proper position during movement from the point of assembly contact on belts 27.

To further definitely secure each article and its blank together and insure the retention of the proper registered positions, an important part of the invention consists in means and a method for folding or turning up the projecting blank portion or margin *b* and pressing it in adhesive contact with an adjacent portion, specifically, in the present instance, the front vertical face, of the article, soon after assembly contact. This operation is performed in the present embodiment of the invention by fingers 40 movably mounted on assembly conveyor chains 41, at least two of the chains being provided. The number of chains may be varied in accordance with the transverse dimension of the articles and other considerations. These chains pass about sprockets 42 on shaft 25 and other sprockets 43 on a shaft 44, suitable means being provided for driving the various moving parts, such as shafts 7, 25 and 44, the details of such driving mechanism not being important in the broader aspect of the invention, and one representative driving mechanism being sufficiently shown and described in the above identified parent application. While the fingers 40 may be variously arranged, desirably there is a pair of fingers being formed in a body 45 which is pivoted on one of the pins 46, this pin being extended to form a pivotal mounting for the two finger bodies 45 at opposite sides of the chain. Plates 47 are substituted for the ordinary chain links at the points of connection of the finger bodies and these plates are provided with guides 48 for plungers 49, which are connected to pivoted studs 50 between each pair of fingers 40. A spring 51 surrounds each plunger and bears against the guide member 48 to urge the connected fingers 40 to upright position, as shown in Figure 2. Each body 45 has a depending member or toe 52. Adjacent to shaft 25 are cam members 53, and as each pressing finger assembly is carried forward on the lower stretch of its chain 41, the toe members 52 engage the surface of the corresponding cam bodies 53, and the fingers 40 are thus retracted in the direction of chain advance and inwardly toward the chain line, as they move up toward the position shown in Figure 1. Before the fingers 40 reach the position shown in Figure 1, they are fully retracted. The upper stretches of chains 41, of course, run in the same level and at the same speed as the upper stretches

of belts 27. The projecting blank margins *b* are thus positioned over the retracted fingers, and as the assembly advances further upon the first portions of the upper stretches of chains 41, the toe members 52 pass away from the surfaces of cams 53 and fingers 40 are elevated by springs 51 to practically upright position, as shown at the right in Figures 1 and 3, thus turning or folding the projecting blank margin *b* upward and pressing it against the forward face of the article, to which it adheres by reason of the adhesive previously applied to the blank. During the entire movement of the assembly over the conveyor chains 41, the fingers retain the blank margins in the stated position, and by the time the assembly is discharged to folding mechanism or any other devices which act upon it, the adhesive has set sufficiently to properly retain the margin in position on the article. The turning or folding of the blank margin and the securing of it to the upright article face is accomplished as soon as possible after the original assembly contact, and this method of affixing a blank margin very effectively connects the blank and article and holds them in the proper registered positions during their further movement. The pressing bars 35 may be extended rearward over chains 41, or preferably, separate similar pressing bars or rails 60 are located above chains 41 and spring-pressed into engagement with the upper surface of the articles, which serves to hold the articles firmly on the blanks as the assemblies advance with the chains. The upper stretches of chains 41 may be supported by bars or rails 70, carried by frame cross members 71 and 72.

While the mechanism in its present embodiment provides for continuous movement of the articles and blanks, and of the assemblies, and the projecting blank margins are turned up during continuous assembly movement, the invention in its broader aspect is not limited to such continuous movement of the materials, and especially with regard to the assemblies, it is not necessary that they shall be moved continuously away from the point of assembly contact. For example, the conveying means, represented in the present structure by chains 41 might be driven intermittently by any suitable mechanism, such as Geneva mechanism, and in that case the blank margin turn-up might be performed while the assembly is at rest. Therefore, where, in the claims, reference is made to the conveyance, advance, or movement of assemblies, and to the turning up of blank portions during such conveyance, advance, or movement, it is not intended thereby to imply a necessary limitation to continuous advance, conveyance or movement of the assemblies, since such movement might be, as above stated, temporarily or intermittently interrupted and the turn-up might be performed during such pause, without departing from the general idea of movement of the assemblies away from the point of assembly contact.

Since a continuously moving mechanism in general operates more smoothly and rapidly than a discontinuous or intermittently driven mechanism, and since in the present invention a problem was involved in continuously moving the materials and properly assembling them during such movement, and especially in performing the blank margin turn-up during continuous movement of the assemblies, the provision of means for performing this operation during the continuous assembly movement is an important feature of the invention in one of its more limited aspects, and certain claims therefore definitely refer to the continuous assembly movement, during which the turn-up operation is performed.

We claim:

1. Assembly supporting and manipulating mechanism for blank and article handling machines of the class described, comprising a conveyor chain, blank-margin manipulating fingers mounted thereon and means for retracting and advancing the fingers during movement of the chain.

2. Assembly supporting and manipulating mechanism for blank and article handling machines of the class described, comprising a conveyor chain, sprockets supporting and driving the chain in a continuous circuit, a presser-finger body pivotally mounted on the chain, presser fingers carried by the body, a cam follower on the body, spring means for advancing the fingers to active position and a stationary cam to cooperate with the cam follower and retract the fingers as the finger body moves with the chain toward a blank manipulating position.

3. Assembly supporting and manipulating mechanism for blank and article handling machines of the class described, comprising a conveyor chain, sprockets supporting and driving the chain in a continuous circuit, a presser-finger body pivotally mounted on the chain, presser fingers carried by the body, a cam follower on the body, spring means for advancing the fingers to active position and a stationary cam to cooperate with the cam follower and retract the fingers as the finger body moves with the chain about one of the sprockets, the cam being arranged to release the follower and permit advance of the fingers to active position substantially as the finger body commences to move with the cam chain along a straight stretch thereof.

4. Assembly supporting and manipulating mechanism for blank and article handling machines of the class described, comprising a plurality of parallel conveyor chains,

blank-margin manipulating fingers mounted thereon and means for retracting and advancing the fingers during movement of the chains.

5. Assembly supporting and manipulating mechanism for blank and article handling machines of the class described, comprising a plurality of parallel conveyor chains, sprockets supporting and driving the chains in continuous circuits, presser finger bodies pivotally mounted on the chains, presser fingers carried by the bodies, a cam follower on each body, spring means for advancing the fingers to active position, and stationary cams to cooperate with the cam followers and retract the fingers as the finger bodies move with the chains toward a blank manipulating position.

6. Assembly supporting and manipulating mechanism for blank and article handling machines of the class described, comprising a plurality of parallel conveyor chains, sprockets supporting and driving the chains in continuous circuits, presser finger bodies pivotally mounted on the chains, presser fingers carried by the bodies, a cam follower on each body, spring means for advancing the fingers to active position, and stationary cams to cooperate with the cam followers and retract the fingers as the finger bodies move with the chains about certain corresponding sprockets, the cams being arranged to release the cam followers and permit advance of the fingers to active position substantially as the finger bodies commence to move with the chains along straight stretches thereof.

7. In article and blank handling mechanism, a rotary blank platen, an assembly supporting and conveying chain posterior to the platen, movable blank manipulating fingers thereon, a shaft and a sprocket thereon, supporting a bend of the chain adjacent to the platen, a pulley on said shaft, and an assembly supporting belt passing about said pulley and the platen to support an assembly in movement from the platen to the chain.

8. In article and blank handling mechanism, a rotary blank platen, parallel assembly supporting and conveying chains posterior to the platen, movable blank manipulating fingers thereon, a shaft and sprockets thereon supporting bends of the chain adjacent to the platen, pulleys on said shaft, and assembly supporting belts passing about said pulleys and the platen to support an assembly in movement from the platen to the chains.

9. Assembly supporting and manipulating mechanism for blank and article handling machines, comprising conveyor mechanism and blank margin manipulating fingers, and means for retracting and advancing the fingers in timed relation to movement of the conveyor mechanism.

10. Assembly supporting and manipulating mechanism for blank and article handling machines, comprising a conveyor, blank margin manipulating means thereon, and means for operating said blank margin manipulating means in definite relation to the conveyor movement.

Signed at Philadelphia, in the county of Philadelphia and State of Pennsylvania this 3rd day of November A. D. 1923.

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