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METHOD AND MACHINE FOR BANDING ARTICLES IN TRANSIT

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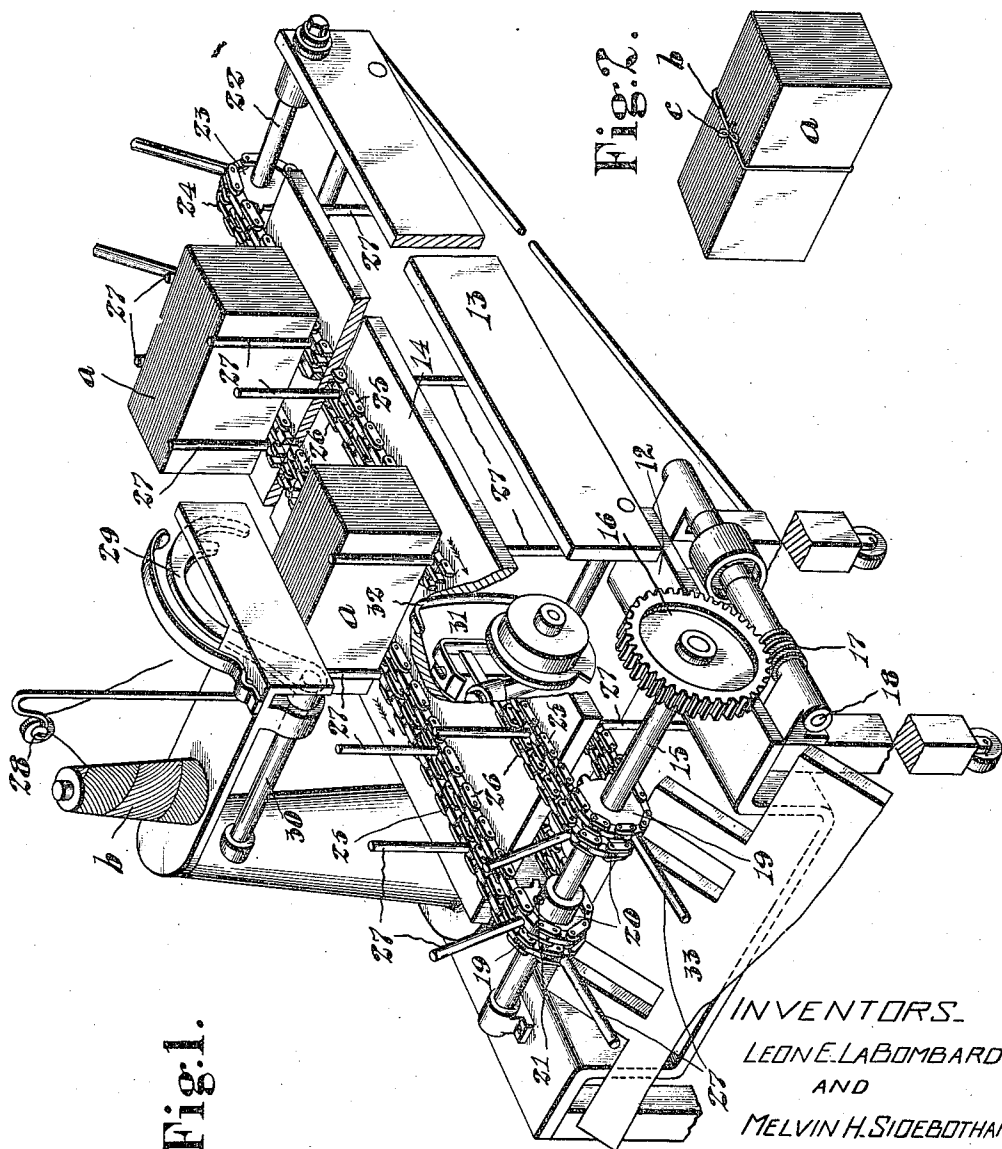


Fig. 2.

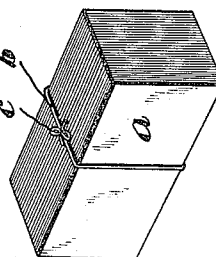


Fig. 1.

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METHOD AND MACHINE FOR BANDING ARTICLES IN TRANSIT.

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To all whom it may concern:

Be it known that we, LEON E. LA BOMBARD and MELVIN H. SIDEBOTHAM, citizens of the United States, and residents of Chelsea, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Methods and Machines for Banding Articles in Transit, of which the following is a specification.

This invention relates to the production of groups of articles in the form of banded packages ready for shipment, and has particular reference to facilitating the output in factories which make envelopes or paper boxes in flat folded condition.

Nearly if not all machines which convert flat paper blanks into flat folded boxes deposit the boxes in overlapping condition upon a belt which travels slowly. Such a machine is illustrated in Letters Patent 1,346,899, granted July 20, 1920, L. E. La Bombard, inventor. The receiving belt which constitutes a travelling platform for the boxes is indicated at 195 in Figures 5 and 8 of that patent. By any one of several well-known types of mechanism called counters, every 25th or 50th box is somewhat displaced from the others so that an attendant can easily pick up the boxes in groups of 25 or 50 each. All this is well-known. The practice then is for the attendant who picks up the groups to place said groups in racks which are usually mounted on casters, and the racks, carrying a greater or lesser number of groups, are then pushed away to any convenient location where other employees tie each group with string either by hand or some suitable tying and knotting machine, to prepare the groups for the employee who puts the packages in shipping boxes. As will readily be understood, all this requires several employees to attend to the output of one folding machine, especially when such machine produces, as some do, 75,000 to 100,000 an hour.

The object of the present invention is to enable the use of the racks and their attendants above referred to to be dispensed with, by providing for the automatic banding of groups of envelopes or folded boxes or similar articles while the latter are in motion, the carrier for the groups being so constructed that one attendant is sufficient to

accomplish the transfer of boxes delivered by the folding machine to said carrier which then maintains the boxes in the form of groups until they reach the banding mechanism and are secured thereby and delivered for boxing.

With this object in view, our invention consists in the improved method of operation substantially as hereinafter described and claimed, and in certain devices for carrying out the method.

A preferred form of mechanism to illustrate the invention is indicated in the accompanying drawings in which—

Figure 1 is a perspective view, partly broken out, and

Figure 2 is a perspective view of a package banded with string as effected by the mechanism of Figure 1.

A suitable frame 12, the legs of which may be mounted on casters, is provided with extension bars 13 connected by tie rods which support a table 14.

Mounted in suitable bearings carried by the frame is a shaft 15 having a worm wheel 16 driven by a worm 17 carried by a shaft 18 which is driven by any suitable motor. The worm drive of the shaft is preferred because of the slow speed desirable for the carrier chains presently described.

Secured to the shaft 15 are two sprockets 19 and between them are two other sprockets 20 which are preferably adjustably secured to the shaft as by means of set screws 21.

Idly mounted on a shaft 22 supported by the bars 13 are pulleys or sprockets 23, 24. Four chains are mounted on the sprockets, the upper runs of the chains passing over and supported by the table 14. For convenience of description the two chains 25, which are driven by the sprockets 19, are referred to herein as the outer chains, while the two chains 26, which are driven by the sprockets 20, are referred to as the inner chains because they are between the chains 25 close thereto.

Projecting perpendicularly from certain links of all four chains are pins 27, said pins being so relatively positioned as to snugly hold groups of articles *a* such as folded paper boxes, or envelopes, or other flat articles placed as indicated in the drawing. It is desirable that changes may be readily made

in the capacity of the pockets formed by the pins, to suit the thickness and number of the articles. This is the chief reason for employing four pin-carrying chains and providing for the adjustment of the sprockets 20. Supposing the chains and their pins when relatively positioned as illustrated provide pockets which will snugly receive and support folded flat boxes or envelopes in groups of 25 each, which have been so counted by the machine folding said boxes or envelopes. If now it is desired that the capacity of the pockets be increased to accommodate a greater number of articles in each, or a similar number of thicker articles, the set screws 21 may be loosened, the sprockets 20 rotatively adjusted in a direction to cause the pins of the inner chains 26 to stand farther to the rear of the pins of the outer chains 25 for each pocket-forming group of pins, and the set screws then tightened. Obviously any other devices for permitting the adjustment described may be employed instead of the set screws 21.

Assuming that the machine is placed adjacent to the delivery end of an envelope-making machine or a box-making machine such as hereinbefore referred to an attendant simply picks up successive groups of the articles and deposits them between the pins of the chains at a point near the receiving end of the table 14. If this is done while the two pins which are to provide the rear wall of the pocket are swinging up from below as the chain passes around the sprockets 23, 24, said two rear pins then act to somewhat compress the group as they approach their upright positions parallel with the preceding pins of that set.

At a suitable point intermediate of the ends of the table we provide means for wrapping or banding each group while in transit in the pin-pockets. The material employed may be a strip of paper the ends of which will be overlapped and secured, or it may be a piece of string the ends of which will be tied together. In the drawing we have indicated the latter, the groups or packets of articles *a* being adapted to be banded by string *b* knotted or tied at *c*.

As string-banding and knotting mechanism of the type illustrated are well-known it will be sufficient to explain herein that string *b* from a source of supply passes through a tension 28 and is then passed around the group of articles and tied or knotted by the operation of arm 29 carried by a rock shaft 30 and the cooperating members indicated as a whole at 31, all of which are caused to act automatically when a group *a* reaches the trip arm 32. As the particular device employed for banding each group when it reaches the trip arm 32 forms no part of our present invention, a detailed description thereof will be unnecessary.

After the banding is accomplished, each banded group is carried along by its pocket-forming pins and is released therefrom as the pins spread apart while passing down around the sprockets of the shaft 15, and it then slides down an inclined guide or chute 33 to any suitable place for packing for shipment.

In the use of the mechanism illustrated, all that the one attendant has to do is to successively place groups of articles, which can usually be grasped by one hand, between the front and rear pins of any set of four, said pins then carrying them past the banding mechanism which is set in operation each time that a group contacts with the trip arm 32. The continued movement of the pins then causes the banded groups to be successively discharged onto the chute 33.

Having now described our invention, we claim:—

1. The method of facilitating the production of flat articles in the form of packages for shipment, consisting in placing the articles in groups upon a carrier and successively tying the groups with string while in motion on the carrier.

2. The method of facilitating the production of flat articles in the form of packages for shipment, consisting in depositing the articles in groups upon a traveling conveyor, maintaining the articles as separate groups on said conveyor, and applying a confiner to each group while in transit on the conveyor.

3. Mechanism for facilitating the production of flat articles in form for shipment, comprising a continuously movable platform having means for supporting the articles in separate groups, and means for banding each group while on said platform.

4. Mechanism for facilitating the production of flat articles in form for shipment, comprising a continuously movable platform having spaced uprights for holding the articles in separate groups, and means for banding each group while between said uprights.

5. In mechanism of the character described, the combination with a plurality of endless chains having pins projecting therefrom, of means for causing said chains to travel uninterruptedly, and banding mechanism in position to operate successively on groups of articles confined between pins of the chains.

6. Mechanism for facilitating the production of flat articles in form for shipment, comprising a movable platform having adjustable pockets for holding groups of articles, and means for banding each group while on said platform.

7. In mechanism of the character described, the combination with a plurality of endless chains having pins projecting therefrom, of means for causing said chains to

travel, and banding mechanism in position to operate successively on groups of articles confined between pins of the chains, means being provided for relatively adjusting the chains to vary the spacing of their pins.

8. The combination with mechanism for banding groups of flat articles, of means for pushing groups successively and uninterruptedly past said banding mechanism.

10 9. In mechanism of the character described, the combination with four parallel endless chains having pins projecting therefrom, of means for adjusting two of said chains to vary the positions of their pins relatively to the pins of the other two chains, means for causing all of the chains to travel at uniform speed, and banding mechanism in position to operate successively on groups of articles confined between the pins of the chains.

20 10. In mechanism of the character described, an endless series of movable pockets, said pockets being exposed to receive groups of articles manually deposited there-

in, normally inoperative means for successively tying the groups, and a trip in the path of movement of the groups for setting the tying mechanism into operation.

11. Mechanism for facilitating the production of flat articles in the form of confined packages, comprising a movable platform having pockets for holding groups of articles, a tripping device in the path of movement of the groups, and means controlled by said tripping device for banding each group.

12. Mechanism for facilitating the production of flat articles in the form of confined packages, comprising a movable platform having pockets for holding groups of articles, a tripping device in the path of movement of the groups, and means controlled by said tripping device for tying string around each group.

In testimony whereof we have affixed our signatures.

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