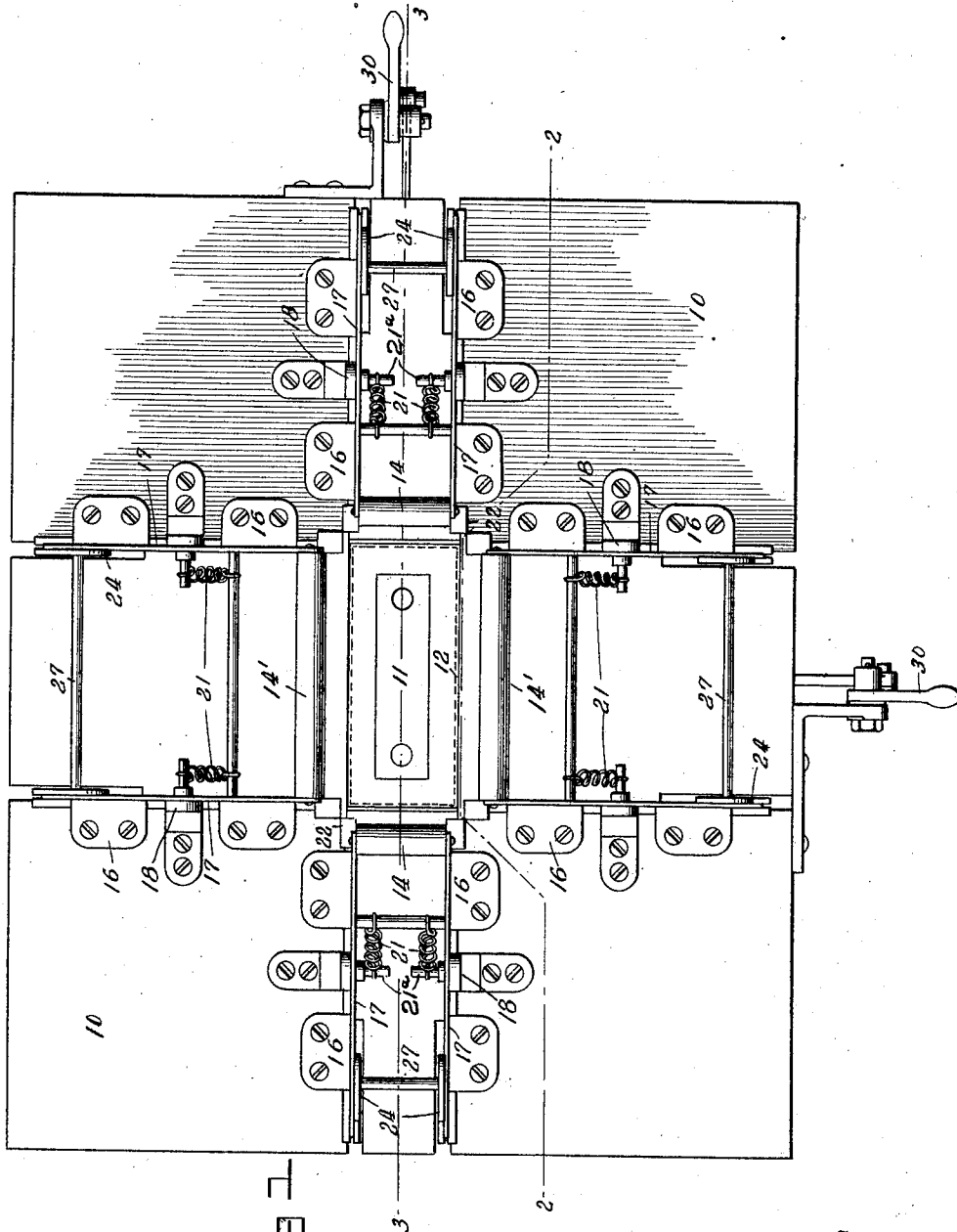


A. GÜTERMANN.
BOX COVERING MACHINE.
APPLICATION FILED JAN. 7, 1911.

1,043,099.

Patented Nov. 5, 1912.

3 SHEETS—SHEET 1.



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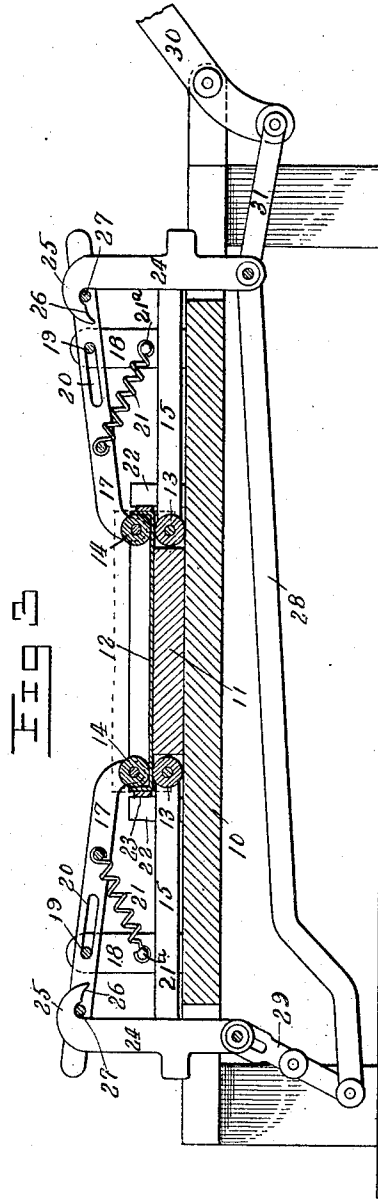
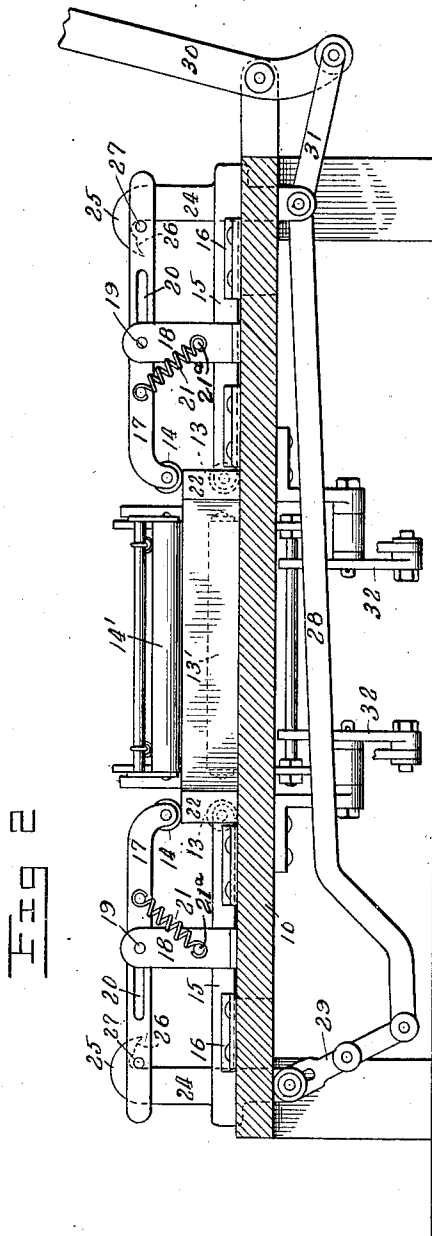


Fig. 2

Fig. 3

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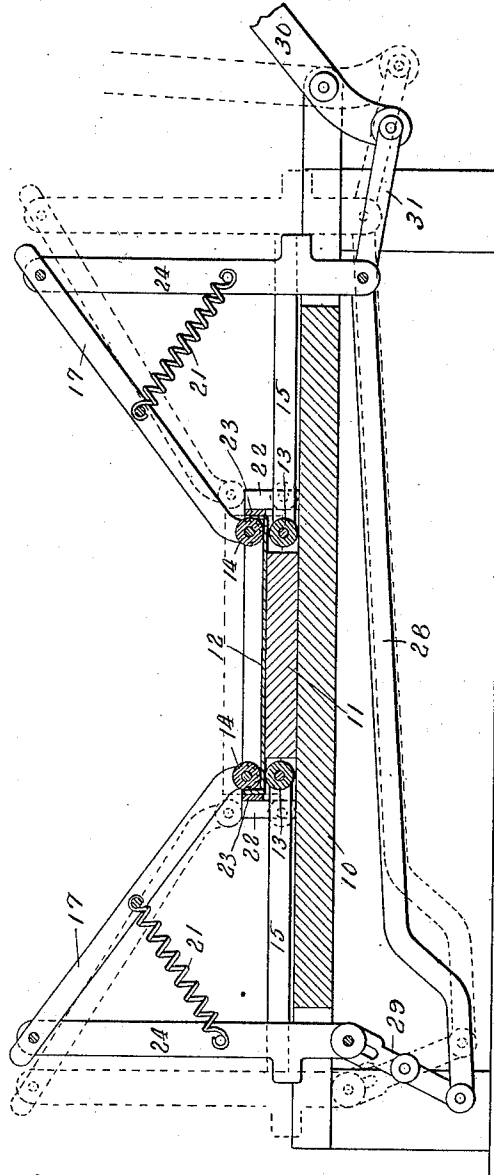


Fig. 3

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UNITED STATES PATENT OFFICE.

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BOX-COVERING MACHINE.

1,043,099.

Specification of Letters Patent.

Patented Nov. 5, 1912.

Application filed January 7, 1911. Serial No. 601,467.

To all whom it may concern.

Be it known that I, ALEXANDER GÜTERMANN, a subject of the Emperor of Germany, residing at Baden, Germany, have invented new and useful Improvements in Box-Covering Machines, of which the following is a specification.

My invention relates to box covering machines of the type used for applying a paper or other sheet covering to the body of a box after said body has been constructed. This operation may take place before or after the body has been wholly completed. The mechanism of this invention is known as a turning-in mechanism, and as such it may be used in connection with box covering machines of many types. The turning-in mechanism of this invention is intended to turn in the edges of an already applied covering, these edges usually projecting both below and above the sides of the surface covered, and are usually turned in at the present time either by hand, or by machine, after the body of the covering has been secured in place.

The mechanism of my invention comprises means for supporting a box to be operated upon, turning-in tools associated with said means, and means for imparting to the tools movements by which the turning-in is effected. A number of the tools are made to operate on the covering simultaneously, whereby speed is secured, and the tools are given different movements, each especially suited to the particular work to be done. Thus when the covering is to be turned over one surface, the tool is given a movement in one plane, and when the covering is to be turned over two surfaces at an angle to each other, the tool is given movements in two planes, and these movements are secured in the very simplest manner possible, and are caused to take place with the greatest accuracy and with high resulting speed of operation and efficiency.

I show in the accompanying drawing one embodiment of my invention. I make use in this embodiment of a table to support the box, and provide roller tools for turning to the bottom of the box body, and to the upper edges and inside of the sides of the box, the edges of an applied covering. The bottom rollers are given a lateral movement beneath the bottom of the box

and toward and from the table, while the top rollers are given both lateral and vertical movements over the top and inner edges of the sides of the box toward and from the table.

Referring to the drawings,—Figure 1 is a general plan view of the mechanism of this embodiment. Fig. 2 is a vertical section on line 2—2 of Fig. 1, looking in the direction of the arrows. Fig. 3 is also a vertical section on line 3—3 of Fig. 1, looking in the direction of the arrows. Fig. 4 is a vertical section showing a modification.

The mechanism in its entirety is carried by a frame 10 having a broad table top. Centrally of this table is located the supporting table 11 for the boxes having applied covers. The top of this table is some distance above the top of the supporting frame 10. The box to be covered, as well as the table, are shown as rectangular. This box 12 is shown in Fig. 3 on the table, with its bottom resting flat on the top of the table, and its body projecting beyond the sides of the table some distance at all points. This is clearly shown in Fig. 1 wherein the dotted line 12 indicates the outer boundary of the box on the table. The size of the table is made generally to accord with the size of the box to be operated upon, my purpose being to change the size of the table whenever required. 13, 13 designate the lower end turning rollers, while 13', 13' (see Fig. 1) designate the lower side turning rollers. 14, 14 designate the two upper end turning-in rollers, while 14', 14' designate the two upper side turning-in rollers.

The lower turning-in rollers 13 and 13' are carried by laterally reciprocable frames 15, the lateral movement of which is in a plane parallel to the top of the supporting table 12. These frames are guided in their movements by guides 16, secured to the support 10. The circles of the rollers 13, 13' are tangent at their tops to the top of the supporting table, or substantially so, and they normally occupy a position away from the table and beyond the sides of a box to be operated upon, as shown in dotted lines in Fig. 2, and parallel to the table side.

The upper turning-in rollers 14, 14' are supported in frames 17 mounted on a fixed upright 18 in each case, and connected there-

to by a pin and slot connection 19 and 20. The frame 17 thus may have lateral movement to the extent of slot 20, and rotary or pivotal movement around the pin 19.

5 Springs 21 connected to the frames beyond the slots 20 at one end, and at the other end to a fixed part 21^a normally press the frames 17 downwardly at their inner ends and hold the turning-in rollers 14, 14' upon rests 22.

10 These rests 22 are fixed in position adjacent the sides of the table 12, and are of a height equal to the height of the tops of the sides of a box resting upon the table as shown. Within these rests 22 is a frame 23 of rec-

15 tangular or other shape, adapted to fit closely around the outsides of a box and support the same while it is being operated upon.

Rising from each of the lower frames 15 is an upright 24, the upper end of which 25 is turned inwardly, and carries on its under side cams 26. Connection is made with the upper frames 17 by these cams through cross bars or pins 27.

25 A box with an applied covering having been placed upon the table 11 as shown in Fig. 3, and the turning-in rollers occupying the position shown in Fig. 2, the projecting edges shown in dotted lines in Fig. 3 may

30 be rapidly and efficiently turned-in by the mechanism as described. The lower frames 15 are simply reciprocated toward and then from the table. During this operation the lower turning-in rollers 13 are moved in-

35 wardly beneath the bottom of the box as shown in Fig. 3, thus turning-in and pressing firmly to the bottom of the box the bottom edge portions of the covering. The covering is pressed to the bottom of the box

40 both during the inward and outward movements of the rollers 13. During this operation also the upper turning-in rollers have been moved laterally inward from the rests 22 turning the top edges of the covering over

45 the top edges of the box and then downwardly inside of the box, the springs 21 drawing the upper rollers quickly downward as soon as over the edges of the box, and pressing the covering firmly to the

50 inner faces of the sides of the box. This movement of the upper frames 17 is instituted by the engagement of the uprights 24 with the bars 27. Upon the outward movement of the frames 15 to their normal position,

55 the bars 27 are engaged by the cams 26 which are so disposed as to bear upon the bars 27 and turn the frame 17 about the pivots 19, thus lifting the rollers 14, 14' to the top of the box, whereupon they are drawn laterally outward to normal position,

60 the lost motion connection 19, 20, permitting free lateral as well as rotary movement. In the outward as well as in the inward movement of the rollers 14, 14', the cover-

65 ings are likewise given an additional pres-

sure to the sides of the box, the springs 21 remaining under tension.

My invention also comprises mechanism whereby the turning-in tools operated by the mechanism just described may be operated together and in regular order. To this end, I have provided a reverse lever connection between the mechanisms on opposite sides of the supporting table. Thus in Fig. 3 the end turning-in rollers 13 and 14 are connected by link 28 and reverse lever 29, so that when one frame 15 is operated, the other frame 15 is similarly operated, the opposite end rollers thus simultaneously performing the same operations upon the opposite ends of the box. A hand operating lever 30 connected to the mechanism by link 31 is shown for operating the mechanism, but it is to be understood that I may use any suitable power operating means, such for instance, as electric or other power suitably applied. The opposite side turning-in rollers 13', 14' are similarly connected together by a reverse lever connection for simultaneous operation, as shown in Fig. 2, and two of these connections 32, 32 are provided. This gives greater accuracy and uniformity of action to the longer side rollers. In case the portions of the covering to be turned-in do not overlap the side rollers may be operated simultaneously with the end rollers by making them of suitable dimensions, but in case there is an overlap, the end turning-in rollers and side turning-in rollers are operated successively.

The top turning-in rollers may be operated without the use of the cam connection 26, 27, if the frames 17 are given a sufficient inclination to the vertical. This I show in Fig. 4. The frames 17 have quite an inclination and are connected at their upper ends to the upper ends of the extended uprights 24 by a simple pivotal connection. It is obvious that upon the withdrawal of the frames 15 from the position shown to their outer dotted line position, the rollers 14 will simply ride upward and out of the box to the rests 22. As is the case with the first embodiment described, springs 21 maintain the rollers 15 pressed to the surfaces of the box so as to firmly secure the covering thereto. In all of these instances, it is, of course, assumed that the covering has been suitably coated with adhesive.

While I have described the best form of my invention now known to me, I desire to have it understood that my invention may be given many forms without departing in anywise from its generic spirit. Thus, for instance, any suitable form of turning-in tool may be used, and any suitable form of supporting means which give to the tools the movements specified may be used. I desire to cover in the annexed claims all such modifications.

The frame 23 surrounding the box may be stationary on the frame 10 and the box removed by hand when the turning-in tools have been withdrawn. Or the frame and the table 11 may be then caused, by suitable mechanism, to rise vertically so as to carry the finished box above the uprights 24 and the table 11 rising farther than the frame 23 pushes the box out of the frame so that it can be struck on the edge and ejected sideways by any suitable ejecting mechanism of known construction.

What I claim is:—

1. A turning-in mechanism comprising a table adapted to support a box body having an applied cover, a frame adapted to reciprocate at right-angles to a side of the table, a turning-in tool hingedly mounted in said frame, and tension means for the tool adapted to hold the same against the edge of the box and to cause it to ride thereover against the inner wall of the box when moved by said frame toward said table.

2. A turning-in mechanism comprising a box-supporting table, a frame movable toward and from the side of the box, a rest engaging against the side of the box and having its upper edge flush with the upper edge of the box, a spring-pressed turning-in tool hinged in the frame, and normally resting on the said rest, and means for moving the frame inwardly whereby the tool is moved from the rest over the edge of the box and against the inner wall of the side thereof.

3. A turning-in mechanism comprising a supporting table for a box having an applied cover, a lower turning-in tool, the body of which lies below the plane of the top of the table, means for moving the same laterally toward and from a side of said table, an upper turning-in tool above and spaced away from a side of said table, a pivotal support for said upper tool, and a cam connection between the said pivotal support and the means for moving the lower tool.

4. A turning-in mechanism comprising a support for a box with an applied covering, a rest against the side of the box and being of equal height therewith, a frame for movement toward and from the side of the box, and a turning-in tool yieldingly mounted in the frame and being normally supported on the rest when said frame is retracted from the box, the inward movement of said frame advancing said tool into the box, said tool yieldingly bearing and riding over the edge of the box and against its inner face to turn in the applied covering.

5. A turning-in mechanism comprising a supporting table for a box with an applied covering, a lower turning-in tool, a reciprocating frame supporting said tool and having a movement toward and from the side

of said table and parallel to the top thereof, an upper turning-in tool, a fixed support, a frame which carries said upper tool and has a connection with said fixed support which permits both lateral and rotary movement with respect to the support, and means connecting the frame of the lower tool with the frame of the upper tool, which means imparts to said upper tool through said upper frame movements in two planes.

6. A turning-in mechanism comprising a supporting table for a box with an applied covering, a reciprocating frame for movement toward and from the box, a lower turning-in tool carried by the frame for engagement with the cover of the box, an upper turning-in tool loosely hinged on the frame for engagement with the cover of the box to turn the same down into the box, and a cam on the frame engaging the hinged tool to lift the same out of the box prior to the outward movement of the hinged tool with the frame.

7. A turning-in mechanism comprising a supporting table for a box with an applied covering, a reciprocating frame at the side of the box for movement toward and from the same, a lower turning-in tool fixed upon the frame for movement therewith, an upper turning-in tool hinged upon the frame, tension means carried by the frame and having connection with the upper turning-in tool to normally depress the same, a rest disposed against the side of the box for the reception of the upper turning-in tool to hold the same in alinement with the upper edge of the box, said upper turning-in tool adapted for movement inwardly from the rest whereby it is permitted to move down into the box, and a cam carried upon the frame for engagement with the upper turning-in tool to raise the same out of the box prior to the outward movement of the tool.

8. A turning-in mechanism comprising a box-supporting table, a rest spaced from the table for engagement against the outer side of the box, a frame movable toward and from the side of the box, a turning-in tool carried upon the frame for engagement beneath the box, an upper turning-in tool loosely hinged upon the frame and adapted for normal engagement upon the rest, said upper turning-in tool adapted to move inwardly from the rest and down into the box, and a cam upon the frame for engagement with the upper turning-in tool to raise the same out of the box prior to returning the tool to the rest.

9. A turning-in mechanism comprising a supporting means for a box with an applied covering, rests at the sides of the box flush with the edges thereof, reciprocating frames movable toward and from the sides of the box, and turning-in tools yieldingly carried in the frames and normally bearing on the rests when said frames are retracted from

the box, said turning-in tools yieldingly pressing the applied covering over the edges of the box and against the inner walls of the same upon the inward movement of said frames.

10. A turning-in tool comprising a supporting means for a box, a laterally movable frame, a rest at the side of the box, and a turning-in tool yieldingly carried in the frame and being yieldingly held to the rest in line with the edge of the box, said frame being adapted for movement toward the box whereby the turning-in tool rides over and yieldingly presses against the edge of the box and against the inner wall of the same.

11. A turning-in mechanism comprising a supporting table for a box having an applied covering, opposed frames movable in unison toward and from the opposite sides of the box, rests flush with the edges and at the sides of the box, turning-in tools movable in the frames, tension means applied to the turning-in tools to yieldingly hold the same normally against the rests, and operating means for the frames to move the same inwardly whereby said turning-in tools ride over and yieldingly press against the opposite edges of the box and against the inner walls of the same to turn in the applied covering.

12. A turning-in mechanism comprising a

means for supporting a box provided with an applied covering, a frame mounted for lateral movement toward and from a side of the box, a rest at the side of the box in line with the edge thereof, a roller mounted for swinging movement in the frame, and tension means for the roller normally holding the same against the rest whereby upon the inward movement of the frame said roller rides over the edge of the box and presses against the inner wall of the same.

13. A turning-in mechanism comprising a box supporting table, rests spaced from the table for engagement against the outer sides of the box, opposed frames movable toward and from the sides of the box, lower turning-in tools carried in the frames for engagement beneath the box, and upper turning-in tools in the frames for normal engagement upon the rests, said upper turning-in tools adapted to move inwardly from the rests and ride over the edges of the box and against its inner walls.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALEXANDER GÜTERMANN.

Witnesses:

ALBERT BEECKMANN,
EUGEN WELLEY.