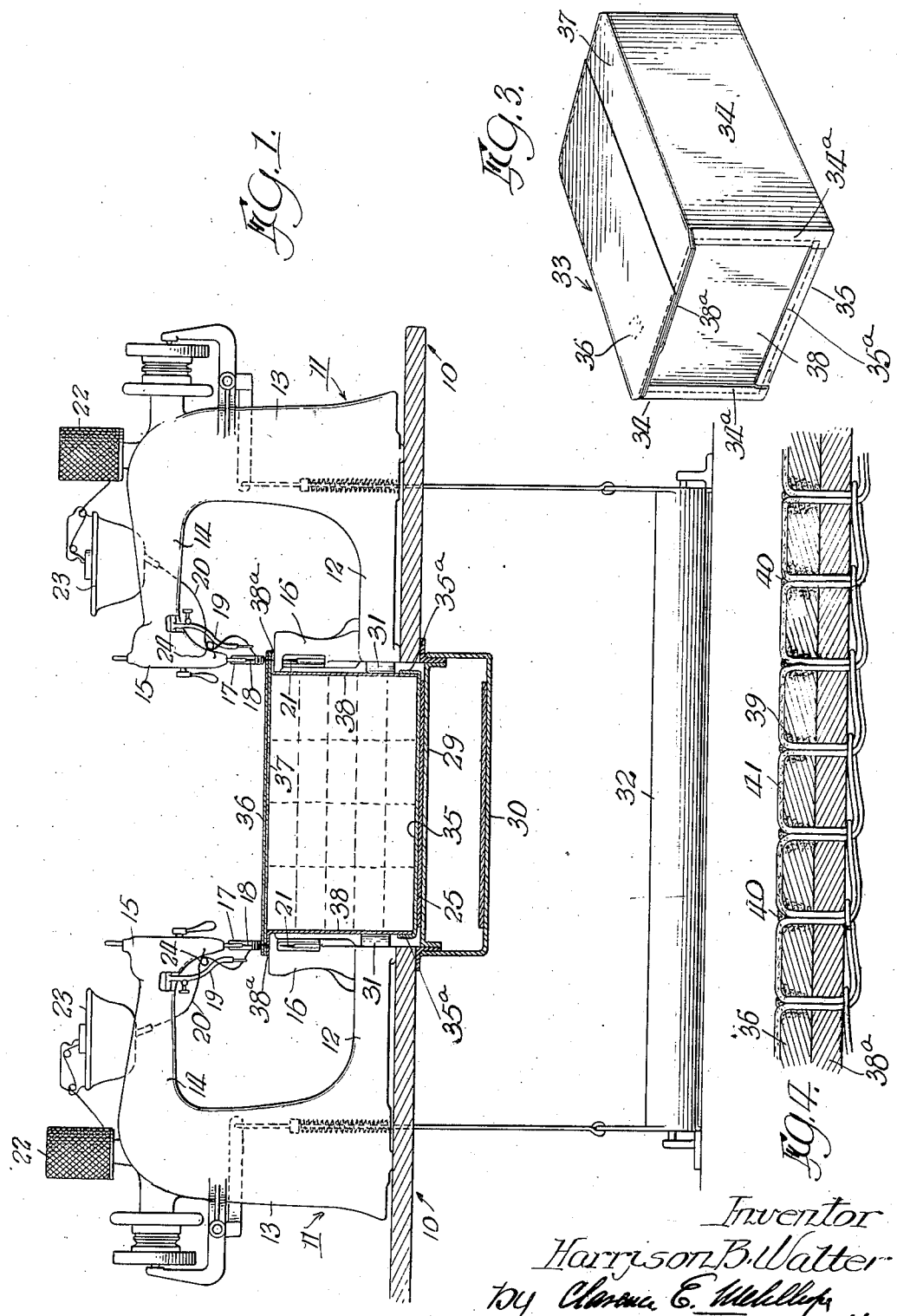
Mar. 27, 1923. 1,449,467

H. B. WALTER

ART OF MAKING BOXES AND IN BOXES MADE OF FIBER OR PAPER BOARD

Filed June 12, 1922 3 sheets-sheet 1



Mar. 27, 1923. 1,449,467

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ART OF MAKING BOXES AND IN BOXES MADE OF FIBER OR PAPER BOARD

Filed June 12, 1922 3 sheets-sheet 2

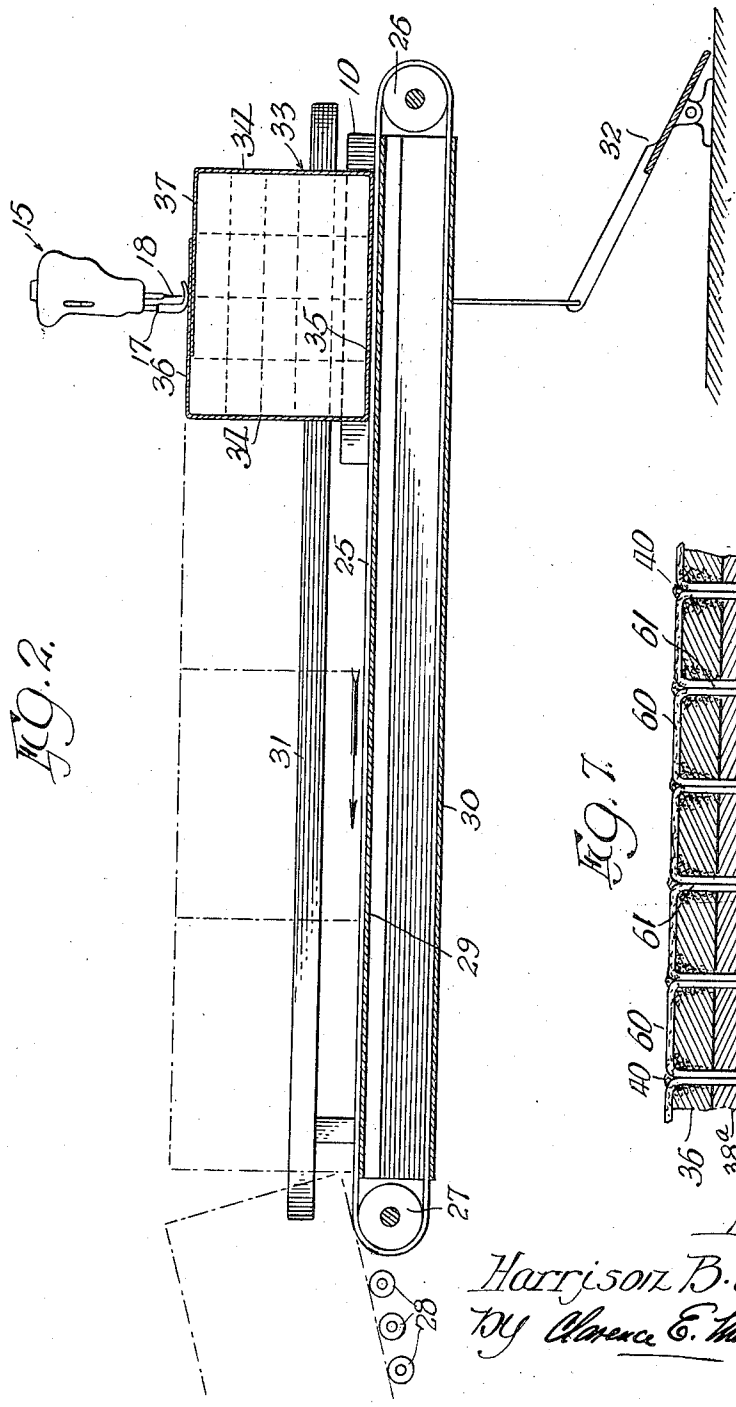


Fig. 2.

Fig. 1.

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Filed June 12, 1922 3 sheets-sheet 3

FIG. 5.

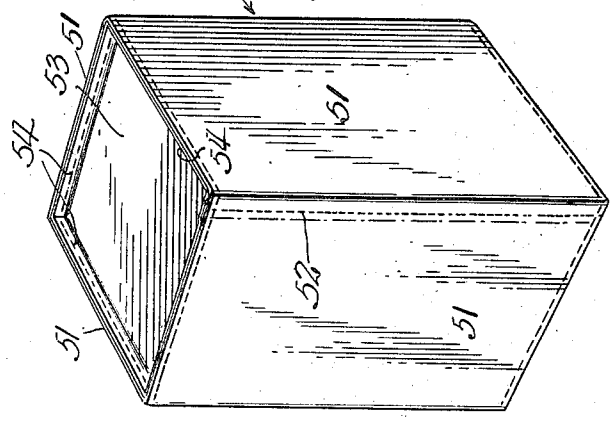
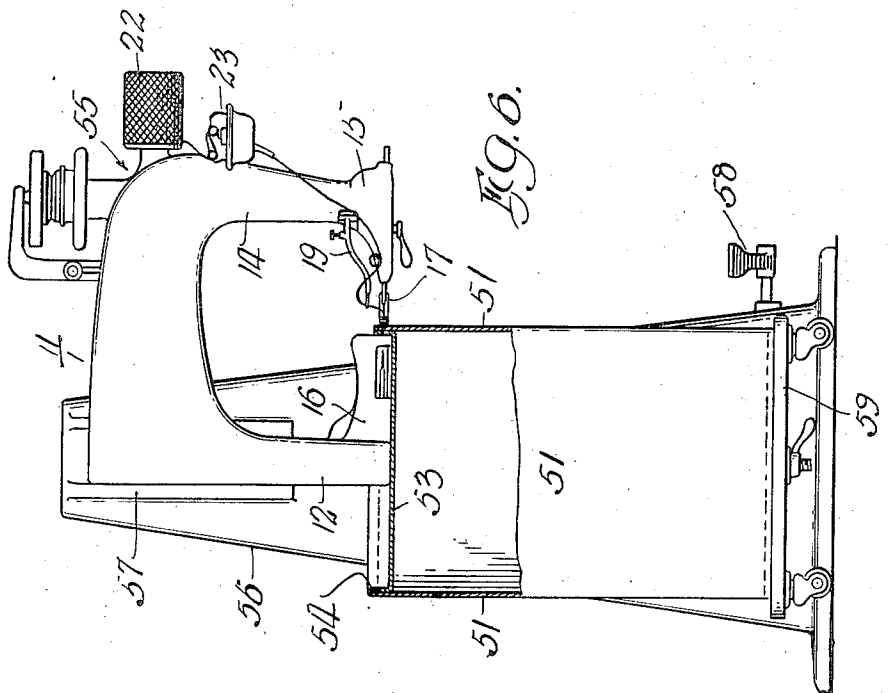


FIG. 6.



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Patented Mar. 27, 1923. 1,449,467

UNITED STATES PATENT OFFICE.

HARRISON B. WALTER, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHICAGO MILL AND LUMBER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ART OF MAKING BOXES AND BOXES MADE OF FIBER OR PAPER BOARD.

Application filed June 12, 1922. Serial No. 567,747.

To all whom it may concern:

Be it known that I, HARRISON B. WALTER, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in the Art of Making Boxes and in Boxes Made of Fiber or Paper Board; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improvement in the art of making boxes and to a novel box made of fiber or paper board and consists of the matters hereinafter described and more particularly pointed out in the appended claims.

In the manufacture of boxes of fiber or paper board heretofore, the boxes have been made from one or more blanks of fiber or paper board, which are suitably cut and creased or scored to form the box, and the several parts, not made integral in the blank or blanks, are attached together, when setting up and closing the box, by means of adhesive strips, or by staples.

In general, such boxes are made so that the blanks may be shipped knocked down or collapsed and are then set up and the parts, attached together where necessary, by the packer; after the boxes have been filled, the part or parts of the box which form the closure are attached in place, generally in the same way as above described, namely, by means of adhesive strips or by means of staples applied by a suitable machine.

The use of adhesives or adhesive strips in attaching the parts of such boxes together or in attaching the closure part or parts in place is objectionable in many cases because the constituents of the adhesive material have a deleterious effect upon the contents of the box. In addition, the adhesives generally employed are not efficient for use with the heavier, larger boxes such as large shipping cases.

The use of staples for attaching the parts of the box together or for attaching the closure in place, has the disadvantage that the joints made between the attached parts are not closed, except in the immediate vicinity of the staples. Thus, boxes with parts or closures secured together or in place by staples are not desirable for packing loose, powder-like substances. Another and serious disadvantage of staples in boxes of the kind is that, in the presence of moisture, as when the boxes are placed in cold storage or are allowed to stand in other damp locations for any length of time, the staples rust and the board rots in the vicinity of the staples. As a result, the staples pull out easily and the joint is broken.

Again, it has been found, that with the stapling machines now in use and with the limitations imposed by the necessities of such machines upon the staple forming wire capable of use in such machines, it is not feasible to produce an attachment by stapling sufficiently strong to properly hold the attached parts together when the boxes are made of the heavier stock required to meet the demands of the larger shipping cases.

In addition, limitations in the speed of attaching the parts of boxes together by stapling are imposed by reason of the nature of the operation of the stapling machines. Said machines operate intermittently and, in the great majority of cases, the boxes upon which they operate, are fed by hand. It is almost an impossibility to overcome the inertia of even light boxes, let alone the heavier, packed boxes, to feed them intermittently with any semblance of regularity; and the difficulty increases with the speed. Thus, while skilled workmen have attained great speed in operating stapling machines for the purpose, nevertheless, the speed attainable is necessarily limited by reason of the intermittent character of the feed.

The object of the present invention is to provide an improvement in the art of making boxes of paper or fiber board and a novel box of the kind whereby and wherein the blanks or blank parts forming the box and closures for the box are attached together in a manner greatly superior to that of boxes heretofore produced. The novel box making method is more economical, both in labor and material; it may be carried on at greatly increased speed; it may be used even with the heavier stock now required in the larger shipping cases made of paper or fiber board; and boxes made by its use are entirely free of the several disadvantages hereinbefore enumerated.

These and other objects and advantages of the invention will appear as I proceed with my specification.

In making fiber or paper boxes in accordance with the new art, the blank or blanks of fiber or paper board to form the box are cut and creased or scored in the usual manner,—there being provided along the sides, ends or closures, which are to be attached together, one or more flaps or flanges, which are adapted to be overlapped upon an adjacent part in setting up or closing the box. In setting up or closing the box, said flaps or parts are overlapped in any usual or convenient manner and are then sewed together in overlapped relation with the two parts or flaps flat, the one against the other. The paper board parts or flaps to be attached together are generally quite heavy and stout needles or awls are required to punch the holes for the stitches. In most cases both an awl and a needle will be found necessary;—an awl to punch the hole and a needle to carry the thread or cord for the stitch. In work of the kind, an awl is an accessory and an aid to relieve the work of the needle, (the needle in ordinary sewing operations punching the hole as well as carrying the thread). In rapid operation the awl is apt to get hot and is some cases the needle may serve in part in punching the hole.

Any well known sewing stitch may be use in attaching the flaps or parts of the box together. A convenient and particularly practicable stitch, when any of the present forms of sewing machines are considered, is that familiarly known as the chain stitch, (although it is to be understood that the invention is in no way limited to such stitch). The chain stitch is advantageous because it requires but a single thread or cord; no bobbin is necessary, and the re-threading of the bobbin and the resultant interruption of the otherwise continuous process of sewing is obviated; and the thread or cord for a chain stitch is fed from a single spool or cop which may be of any desired dimensions without requiring any special designing of parts of the machine, so that the feed of thread or cord may be continued to great length without re-threading or renewal of the spool or cop from which the thread or cord is fed. Thus, the continuity of the operation will not be interfered with by the necessity for frequent re-threading.

The length of stitch used is important. The stitch should be as long as practicable. Its length is determined by the number of holes to the inch that may be made in the board parts without producing a line of undue weakening or of low resistance to breaking strain in the board. A spacing of the holes at about three to the inch in heavy stock will be near enough for a stitch, which is sufficiently short to permit the board parts to be drawn securely together to produce such close contact between the engaging surfaces of the board along the line of stitches, that a practically dust proof joint between the engaged parts is produced, with little reduction of its resistance to a transverse breaking strain.

The thread, string or cord used for the stitch is waxed, the wax being preferably applied just in advance of the formation of the stitch. A resinous wax is preferably used. Such waxing not only permits the cord to be more easily drawn through the holes in the board without breaking or tearing the edges of said holes; but in addition, by the use of an excess of the resinous waxy substance, the holes through which the stitches pass are filled with wax, and as the wax is either hot or warm when applied or is heated by the friction of drawing the wax or thread through the holes in forming the stitch, the wax permeates the fiber of the board exposed in the formation of the holes, and after cooling, hardens therein and reinforces and strengthens the board at and about the holes. In addition, the wax waterproofs the holes and where a waterproofing treatment is given to the box-forming-blank, it prevents the waterproof character of the package from being destroyed along the lines of stitching.

Again, the resinous waxy substance fills and hardens in the holes and, thus plugging said holes, acts to retain the stitches in the holes and to resist the withdrawal of the thread or cord from the holes in case the stitch is broken or severed between adjacent holes. This is very important, since, particularly in the case of a chain stitch, a break in the cord or thread any place in the stitched joint would otherwise permit the cord or thread to ravel out and thus destroy the joint. The heavy wax also protects the part of the stitch exposed on the flat outer surface of the board forming the outside of the box, from wear or abrasion, in the rough handling which boxes or shipping cases of the kind are subjected to.

For sewing the overlapped board parts together, any convenient sewing machine may be used, as for instance, the kind of sewing machine used in harness making. In such machine, a short stout awl is provided for punching the holes through the overlapped parts to be attached together, and a needle like a crochet needle is inserted through the hole made by the awl, from the opposite side to receive a loop applied to its end by a "cast-on," which loop is drawn through a previously formed loop on the opposite side to make the chain stitch in a familiar manner.

In sewing machines of the above kind the

needle feeds the pieces to be sewed together; but in the use of such or like sewing machine for the sewing of box parts together, it is necessary, especially when attaching the closures of the box in closed relation after the box has been loaded, to provide an auxiliary feeding means in conjunction with the box support, to impart a feeding movement to the box in synchronism with the feeding movement of the needle.

In order to illustrate the improved art of box making, I attach hereto drawings showing machinery for carrying it out. In one case I have shown machinery for attaching in place the closure of a top-closing paper or fiber board box of the kind disclosed in an application for patent filed by me on April 12th, 1922, S. N. 551,854. In such case, in the drawings:—

Fig. 1 is a diagrammatic cross sectional view showing a box of the specific kind of the above named application in process of having its end projecting top-closure flaps attached to horizontal flanges at the top edges of the ends of a box, by means of sewing machine heads disposed at each side of the box, with conveying and supporting means for the box.

Fig. 2 is a longitudinal central section through Fig. 1.

Fig. 3 is a perspective view of the type of box used for purposes of illustration.

Fig. 4 is a longitudinal section through the overlapping board parts attached together, in the plane of the line of stitching,—the stitch being a chain stitch.

In another case I have shown in the drawing, machinery for attaching in place the end closures of a fiber or paper board box of the kind disclosed in Letters-Patent No. 1,055,243 granted to me on March 14th, 1913. In said case:—

Fig. 5 is a perspective view of the type of box referred to, with the end closures in place.

Fig. 6 is a view in elevation showing a box of the kind in process of having one end closure attached in place with a sewing-machine head disposed in position to apply the stitch and with a rolling deck and form for supporting a box of the kind disclosed in Letters-Patent No. 1,253,754 granted to me on January 15th, 1918.

Fig. 7 is a longitudinal section through overlapping board parts attached together in the plane of the line of stitching:—the stitching being such as that made by the well known Singer sewing-machine.

Referring to the drawings and particularly to Figs. 1 to 4:—10, 10 indicates two horizontally disposed tables or supports which are spaced apart a distance slightly greater than the length of the box to be sewed. Mounted on said tables are the sewing-machines 11, 11, which are preferably power driven in the usual manner. Each machine comprises a base 12 which is fixed to the associated table and an upright standard 13 rising at one end of said base and formed at its top to provide a horizontally disposed, over-hanging arm 14. Said over-hanging arm terminates in a head 15 arranged vertically above an upright platform 16 on that end of the base, which is adjacent to the edge of the table or support 10.

In the head 15 of each machine is provided the usual presser foot and associated rod 17 together with the vertically reciprocating awl 18, the awl being actuated by suitable mechanism in the head driven by the main shaft in the over-hanging arm. Associated with the awl mechanism is a "cast-on" bar 19 which casts the thread or cord 20 upon the needle 21. This needle is located within the platform 16 and has not only a vertically reciprocating movement but also a rearward and forward movement produced by suitable mechanism arranged within the platform.

The thread or cord 20 is fed from a cop or ball 22 mounted in the usual manner upon the frame of the sewing machine. Said thread or cord first passes through a wax pot 23 where it is wax coated and is then passed through a tension device 24, before it is threaded through the "cast-on" bar 19.

The top of the platform 16 is flat and the needle and awl are arranged in a vertical plane quite close to the edge of the platform, which projects a slight distance beyond the edge of the base at the platform end.

Between the two sewing machines and in a horizontal plane somewhat below that of the table, is the top lap of an endless conveyor belt 25, which travels in a direction parallel to the direction of the lines of stitching designed to be applied by the sewing machine. The belt 25 is trained about front and rear rollers 26, 27 either one of which may be utilized as the belt driving roller. A series of discharge rollers 28 are arranged in an inclined plane adjacent to the rear roller 27 for discharging the boxes by gravity from the belt 25.

To prevent the feed belt from sagging under the weight of the boxes thereon, I provide support plates 29, 30 for the laps of the belt. To guide the boxes on the conveyor belt 25, I provide side rails 31, 31, which are fixed at one end to the end of the sewing machine bases and at the other end to the upright bars rising from the tables or plates 29, 30.

Mounted on the floor below the front roller 26 is a foot pedal 32 by means of which the action of the sewing machines may be controlled by the operator who places the boxes upon the feed belt 25. By suitable means (not shown) one of the rollers 26 or

27 is operatively geared to the mechanism which drives the sewing machines in such manner that the belt 25 will be driven in synchronism with the needles of the sewing machines.

The mechanism briefly described above is used for attaching the closure flaps of a box 33, after said box has been loaded. Said box 33 is made from an elongated blank cut and creased to provide sides 34, 34; a bottom 35; and top closure flaps 36, 37. The ends of the box are formed by separate blanks 38, 38. The sides and bottom of the box are provided with flap extensions 34^a, 34^a, 35^a, respectively, at their ends which are creased so as to be folded over against the associated end wall 38. Said flaps being thus brought into flat contacting engagement with the said end pieces of the box and with each other where they overlap, are attached together by means of sewing with thread or cord in the manner hereinbefore described, either by hand or by a machine especially designed for the purpose.

The end pieces 38 have top flap extensions 38^a which are adapted to be folded down into the position of a horizontal flange in the plane of the top of the box when open. The closure flaps 36, 37 are adapted to be folded down, the one overlapping the other, and both bearing upon and in position to have flat contactual engagement with the aforesaid end flaps 38^a.

The boxes are loaded and their top flaps 36, 37 folded down into contactual relation with the top flaps 38^a on the ends of the box. They are then placed in succession on the top lap of the belt 25 with their ends 38 in guiding relation against the rails 31, 31. The box is then brought to position for sewing action by the sewing machines and the treadle 32 is then depressed which brings the sewing machines into operation and also the feed belt with the result that the loaded box is rapidly fed rearward in synchronism with the action of the needles and the overlapped parts at the ends of the box closure are securely sewed and drawn into close contactual engagement by means of the operation of the sewing machines. At the same time, the thread or cord is waxed in advance of the formation of the stitch and the holes or perforations formed by the awls and operated through by the needles are plugged with the excess of wax as hereinbefore described.

It will be manifest that in an apparatus of the kind the attachment of the closures of successive boxes by the sewing process may be carried on continuously and as rapidly as the sewing machines may be operated so that the speed of attachment is limited only by the rapidity with which the boxes may be packed.

The thread or cord is drawn by the action of the needle to bring the contacting surfaces of the parts sewed together into close engagement as shown in Fig. 4.

The hot wax drawn in by the thread or cord in the formation of the stitch fills the fibers of the board adjacent the perforation therein as indicated at 39, (Fig. 4) and acts to plug the perforation itself as indicated at 40 so as to lock or wedge the stitch in said perforation. In addition, this wax coating of the thread or cord provides a protective coating 41 for the cord in the part of the stitch exposed between the perforations on the outer surface of the board.

The machines are adjusted so that the stitches will run about three to the inch, as heretofore described.

Referring now to Figs. 5 and 6:—50 indicates a box made from a blank cut and creased to fold into tubular form to provide the four sides 51 of the box,—said blank having overlapping parts which are attached together along the line of stitching indicated at 52; and from head or end blank closures 53, which are each provided with flange extensions 54 adapted to be folded at right angles to the plane of the head blank, and to be engaged in close contact with the sides of the tubular body of the box at the ends thereof, when the main body of the blank is placed in recessed position within the end of the tube.

The machine for sewing the flanges of the end closures of the box to the sides of the tubular body of the box, as shown in this case, is the same as that illustrated in Fig. 1, with the exception that the sewing-machine head is supported in a position at right angles to that shown in Fig. 1.

55 indicates the sewing-machine head the other parts being indicated by the same numerals as those applied in the preceding figures. Said head is supported on a standard 56 rising from the floor, the head and standard being provided with suitable cooperating ways or guides 57, whereby the machine head may be raised or lowered by means of a treadle indicated at 58, in order to bring the machine head into or raise it from the desired operative position.

59 indicates a rolling deck for the support of the box to be operated upon, which is preferably of the kind shown in the patent hereinbefore referred to, (No. 1,253,754).

In sewing an end closure in a box of this kind the process is carried on in substantially the same way as that hereinabove described. The flanges of the end or head closure are sewed to the side wall of the box by a continuous stitch, passing along one side, then upon rotation of the box through 90 degrees (by means of its support on rolling deck 59) along the next adjacent side of the box and so on, by a continuous operation and with unbroken stitch until the four flanges have

been attached in place to the four sides of the box.

The box is then reversed end for end, on the rolling deck 59, and the other head or end closure is attached in place in the same manner, after loading.

Where a machine with a bobbin is used for making stitches, there will necessarily be a separate line of thread on both surfaces of the box as shown in Fig. 7. In that figure, 60 indicates the thread or cord applied by the needle and lying mainly on one surface of the box but having loops 61 extending through the perforations in the contacting overlapped parts of the box. 62 indicates the thread or cord applied by the bobbin and lying on the opposite surface of the said part of the box and engaged in the loop ends 63 of the aforesaid loops. The wax is indicated as before and with the same numerals of reference.

No machine is shown herein for stitching the ends 38 of the box 33 (Fig. 3) in place, nor for stitching the overlapping parts of the blank forming the tubular body of the box 50 along the line of stitching 52 (Fig. 5). The stitching of said parts together may be carried on by hand, as hereinbefore described, or by special machines, which are not necessary to be shown herein as they form no part of the present invention.

From the foregoing description of the new art of box making, it will be manifest that it is greatly superior for the purpose of making boxes of paper or fiber board. The method used for attaching the non-integral parts of the box forming blank or blanks together, namely, the sewing together of overlapped blank parts, may be carried on as a continuous operation, as distinguished, for example, from the intermittent operation necessarily incident to the attachment of said parts by stapling machines, and the speed of production and of final attachment of the closure or closures of the box is only limited by the possible speed of the sewing-machine or other sewing means used.

The attaching means employed in the new box is lasting, highly efficient and subject to none of the objections to be found in the attaching devices or means heretofore used. The joint produced between attached parts is tight, strong, close, capable of resisting the heaviest and most abusive handling that heavy shipping cases are subjected to, and is without the disadvantages heretofore enumerated.

I claim as my invention:—

1. An improvement in the art of manufacturing boxes made from a blank or blanks of fiber or paper board, which consists in forming the blank or blanks to fold or set up into box form; in providing the adjacent parts, which are non-integral in the folding or setting up and closing of the box, with flaps or parts adapted to be brought into surface-contacting engagement; in bringing said flaps or parts into contacting engagement; and in sewing said parts or flaps together in close surface-contactual engagement.

2. An improvement in the art of manufacturing boxes made from a blank or blanks of fiber or paper board, which consists in forming the blank or blanks to fold or set up into box form; in providing the adjacent parts, which are non-integral in the folding or setting up and closing of the box, with flaps or parts adapted to be brought into surface-contacting engagement; in bringing said flaps or parts into contacting engagement; and in sewing said contacting parts or flaps together,—the contacting surfaces of the said flaps or parts being drawn by the process of sewing into close surface-contactual engagement.

3. An improvement in the art of manufacturing boxes made from a blank or blanks of fiber or paper board, which consists in forming the blank or blanks to fold or set up into box form; in providing the adjacent parts, which are non-integral in the folding or setting up and closing of the box, with flaps or parts adapted to overlap in flat, surface-contacting engagement; in bringing said flaps or parts into overlapping contacting engagement; and in sewing said overlapped parts or flaps together by means of a stitch in such manner as to draw the contacting and engaging surfaces of the said overlapped flaps or parts into close surface-contactual engagement.

4. An improvement in the art of manufacturing boxes made from a blank or blanks of fiber or paper board, which consists in forming the blank or blanks to fold or set up into box form; in providing the adjacent parts, which are non-integral in the folding or setting up and closing of the box, with flaps or parts adapted to overlap in flat, surface-contacting engagement; in bringing said flaps or parts into overlapping contacting engagement; and in sewing said overlapped parts or flaps together by means of cord or thread,—the cord or thread being waxed in the process of sewing to fill the holes in said parts or flaps produced to receive the stitch and the contacting and engaging surface of said overlapped flaps or parts being drawn into close surface-contactual relation.

5. An improvement in the art of manufacturing boxes made from a blank or blanks of fiber or paper board, which consists in forming the blank or blanks to fold or set up into box form; in providing the adjacent parts, which are non-integral in the folding or setting up and closing of the box, with flaps or parts adapted to overlap in flat, surface-contacting engagement; in bringing said flaps or

parts into overlapping contacting engagement; and in sewing said overlapped parts or flaps together by means of a stitch adapted to draw the same into close, surface-contactual relation,—a resinous wax being applied both to the stitch and to the holes through which the stitches pass to plug said holes and to reinforce the stitch.

6. An improvement in the art of manufacturing boxes made from a blank or blanks of fiber or paper board, which consists in forming the blank or blanks to fold or set up into box form; in providing the adjacent parts, which are non-integral in the folding or setting up and closing of the box, with flaps or parts adapted to overlap in flat, surface-contacting engagement; in bringing said flaps or parts into overlapping contacting engagement; and in sewing said overlapped parts or flaps together by means of heavy cord or thread,—the holes for the stitch being formed at close intervals, which are wide enough apart to prevent undue weakening of the board parts, and the contacting surfaces of said flaps or parts being drawn into close contactual relation.

7. An improvement in the art of manufacturing boxes made from a blank or blanks of fiber or paper board, which consists in forming the blank or blanks to fold or set up into box form; in providing the adjacent parts, which are non-integral in the folding or setting up and closing of the box, with flaps or parts adapted to overlap in flat surface-contacting engagement; in bringing said flaps or parts into overlapping contacting engagement; in sewing said overlapped parts or flaps together by means of a chain stitch,—the perforations provided for the stitch being closely spaced but the spacing being short of that which would unduly weaken the board parts to resist a transverse breaking strain; and in applying, during the process of sewing, to the perforations in the board produced by the sewing and to the sewing thread or cord, a resinous wax adapted to harden in and plug the sewing perforations and to protect the sewing thread or cord.

8. A box made from a blank or blanks of fiber or paper board adapted to be folded or set up into box form, said blank or blanks being provided at adjacent parts, which are non-integral in the folding or setting up or closing of the box, with flaps or parts adapted to be brought into surface-contactual engagement, said flaps or parts being sewed together by means of string or cord and being drawn into close surface-contactual engagement.

9. A box made from a blank or blanks of fiber or paper board adapted to be folded into or set up into box form, said blank or blanks being provided at adjacent parts, which are non-integral in the folding or setting up or closing of the box, with flaps or parts adapted to be brought into surface-contactual engagement, said flaps or parts being sewed together with their proximate surfaces in close contacting engagement.

10. A box made from a blank or blanks of fiber or paper board adapted to be folded into or set up into box form, said blank or blanks being provided at adjacent parts, which are non-integral in the folding or setting up or closing of the box, with flaps or parts adapted to overlap in flat, surface-contactual engagement, said flaps or parts being drawn or attached together in close surface-contactual relation by means of a stitch of cord or thread.

11. A box made from a blank or blanks of fiber or paper board adapted to be folded into or set up into box form, said blank or blanks being provided at adjacent parts, which are non-integral in the folding or setting up or closing of the box, with flaps or parts adapted to overlap in flat, surface-contactual engagement, said flaps or parts being drawn together into close surface-contactual relation by means of a line of stitching of cord or thread.

12. A box made from a blank or blanks of fiber or paper board adapted to be folded into or set up into box form, said blank or blanks being provided at adjacent parts, which are non-integral in the folding or setting up or closing of the box, with flaps or parts adapted to overlap in flat, surface-contactual engagement, said flaps or parts being sewed together by means of stitches of cord or thread extending through perforations in the engaging flaps or parts, the said perforations being closely spaced but not near enough to weaken or reduce the resistance of the board to transverse breaking strain, and the stitch being drawn to bring the overlapped flaps or parts into close, surface-contactual relation.

13. A box made from a blank or blanks of fiber or paper board adapted to be folded into or set up into box form, said blank or blanks being provided at adjacent parts, which are non-integral in the folding or setting up or closing of the box, with flaps or parts adapted to overlap in flat, surface-contactual engagement, said flaps or parts being sewed together by means of cord or thread extending through perforations in the engaging flaps or parts, the said perforations being closely spaced but not near enough to weaken or reduce the resistance of the board to transverse breaking strain, the stitch being drawn to bring the overlapped flaps or parts into close surface-contactual relation, and the perforations being filled and plugged with a hardening wax.

14. A box made from a blank or blanks of fiber or paper board adapted to be folded into or set up into box form, said blank or

blanks being provided at adjacent parts, which are non-integral in the folding or setting up or closing of the box, with flaps or parts adapted to overlap in flat, surface-contactual engagement, said flaps or parts being sewed together by means of cord or thread extending through perforations in the engaging flaps or parts, said perforations being closely spaced but not near enough to weaken or reduce the resistance of the board to transverse breaking strain, the stitch being drawn to bring the overlapped flaps or parts into close surface-contactual relation, the perforations being filled and plugged with a hardening wax, and the thread or cord forming the stitches being waxed intermediate said holes.

In testimony that I claim the foregoing as my invention, I affix my signature in the presence of two witnesses, this 7th day of June, A. D. 1922.

HARRISON B. WALTER.

Witnesses:
CLARENCE E. MEHLHOPE,
T. H. ALFREDS.