May 22, 1945. M. L. SVIKHART 2,376,832

MATERIAL APPLYING APPARATUS

Filed Dec. 5, 1942

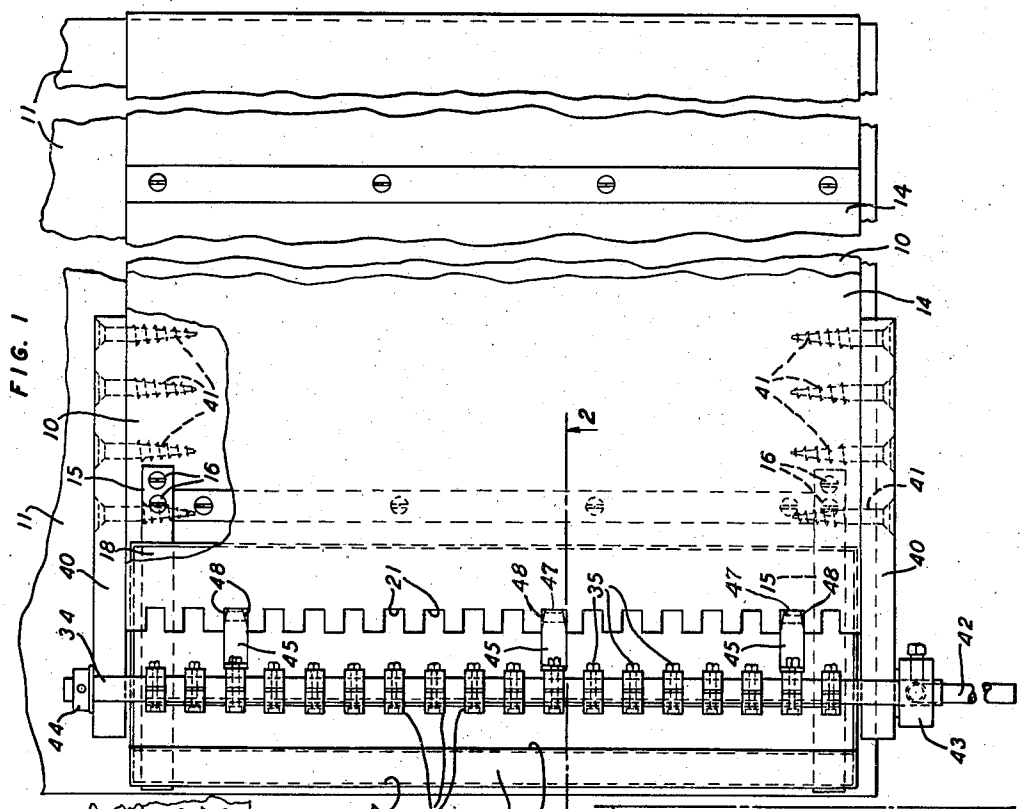


FIG. 1

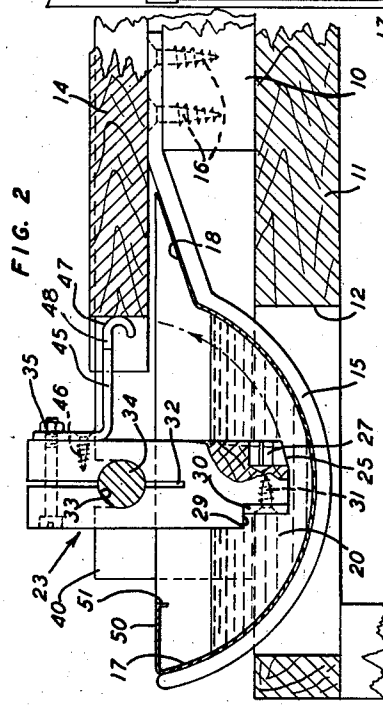


FIG. 2

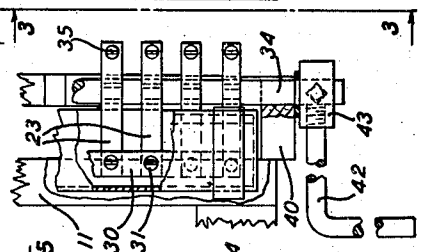


FIG. 3

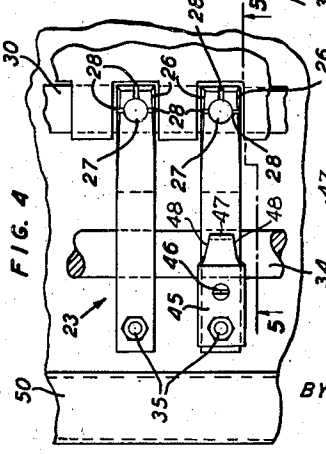


FIG. 4

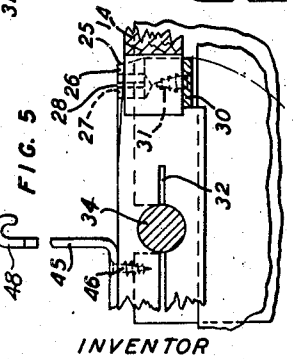


FIG. 5

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## MATERIAL APPLYING APPARATUS

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Application December 5, 1942, Serial No. 467,962

7 Claims. (Cl. 144—280)

This invention relates to material applying apparatus, and more particularly to apparatus for applying glue to lock box joints in wooden parts for assembly.

In the assembly of wooden parts through the gluing of their joints, the speed of the assembly of such parts and the strength of their joints depend largely upon the speed and efficiency of the application of glue at the proper locations.

An object of the invention is to provide a material applying apparatus, and more particularly a simple, efficient and highly practical apparatus for applying material to the walls of apertures in articles.

With this and other objects in view, the invention comprises a support for an article having apertures therein adjacent a tank for a supply of material and material applying elements having contours adapted to substantially fill the apertures to remove quantities of material from the supply and cover the walls of the apertures thereof.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawing, wherein

Fig. 1 is a top plan view of the apparatus, portions thereof being broken away;

Fig. 2 is an enlarged fragmentary sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary detail view taken substantially along the line 3—3 of Fig. 1;

Fig. 4 is an enlarged fragmentary top plan view of a portion of the apparatus illustrating two of the material applying elements, and

Fig. 5 is a fragmentary sectional view taken along the line 5—5 of Fig. 4.

Referring now to the drawing, attention is first directed to Figs. 1 and 2, which illustrate a support 10, which in the present instance is mounted upon a bench 11, the latter being provided with an aperture 12 therein. The support 10 may be of any size depending upon the size of article 14 which is to be treated. A pair of brackets 15, secured to the support 10 at 16 and having the contour shown in Fig. 2, is positioned adjacent the sides of the support to receive and support a tank 17. The tank 17 extends the full width of the support 10 and is substantially semi-cylindrical in cross-section. The inner portion of the tank is formed into a lip 18 which lies upon angular portions of the brackets 15 to catch any excess material 20 during the operation of the apparatus and cause this excess material to drain back into the tank.

It will now be observed that the purpose of the aperture 12 is to receive the lower portions of the brackets 15 and the tank 17. The material 20 in the present instance is a liquid glue of the type desired to join wooden articles or parts. Considering for the moment the article 14, it will be observed that the forward edge thereof is provided with a plurality of apertures or notches 21 which are of the type used in forming lock box joints. To secure two similar parts or articles together merely by gluing of the projections of each part in the notches of the other, it is important that all surfaces of the notches or apertures be completely covered with glue. To accomplish this purpose material or glue applying elements, indicated generally at 23, are employed. These elements are identical in structure and a description of one will apply to them all.

Consider, for example, the element shown in Fig. 2. This element in the present embodiment is formed of wood, it being understood, however, that it could be formed of any desired material. The width of the element, as illustrated in Fig. 4, is slightly less than the width of the apertures 21, allowing a sufficient clearance for the passage of the element into the aperture with which it is registered and the passage of the glue on the element therewith. This clearance is sufficiently small, however, to cause wiping of the glue or material onto the walls of the aperture during movement of the element into and out of the aperture. This same clearance exists between the end of the element and the inner wall of the aperture. The element, however, is beveled, at 25, at its forward or leading edge, to allow entering of this portion of the element into the aperture through an arcuate movement of the element and to position the major portion of the forward surface of the element adjacent the inner wall of the aperture as illustrated in Fig. 5. The forward portion of the element is also beveled at each side, as indicated at 26, to further assist in the entering of the element into the aperture. In the forward portion of the element is disposed a pocket 27, to receive an additional amount of material to be carried into the aperture, outlets 28 being provided to direct this quantity of material to the walls of the apertures or between the element and the walls.

The end or following side of the element is notched, as at 29, to receive a plate 30 which is secured, at 31, not only to the element being described but to all of the elements of the apertures. The plate 30 performs two functions, its main function being to serve as a stop for the

movement of the elements and to locate the forward ends thereof in the apertures 21. The plate 30, extending beneath all the elements 23 and secured thereto, has intermediate portions between the elements which engage the tongue portions of the article 14 between the apertures or notches 21 (Fig. 5) and thus serve as a stop to locate the elements in their respective notches. By again viewing Fig. 2, it will be observed that the element 23 is provided with a slot 32 and an aperture 33, the latter being adapted to receive a shaft 34 while the former provides the element at this portion into two halves which may be drawn together through the aid of a bolt 35 for the rigid mounting of the element upon the shaft.

In the present embodiment there are eighteen elements of the type described, these elements being mounted at spaced positions upon the shaft 34 so that they will respectively register with the apertures 21 in the article 14. The shaft 34 is supported in suitable bearings of brackets 40, the latter being secured, as at 41, to the sides of the support 10. A suitable crank 42 is mounted upon one end of the shaft 34, which has a connecting portion 43 adapted to hold the shaft against movement in one direction, a collar 44 mounted upon the opposite end of the shaft holding the shaft against movement in the opposite direction.

Attention at this time is directed to locating elements 45, three of which are employed in the present embodiment, these elements being identical in structure. By viewing Fig. 2, it will be noted that the elements are mounted upon selected bolts 35 of certain of the elements 23, assisted by the aid of screws 46. The elements extend at right angles from their respective elements 23 and have their forward ends curved as at 47, to provide rounded ends for the elements to engage the inner walls of their respective apertures 21. The sides of the leading ends of the locating elements 45 are beveled, as at 48, to assure entering of the locating elements in their respective aperatures and lateral adjustment of the article if such is found necessary.

There is one feature of the tank which has not been previously described, reference being made to a forward cover portion 50 which has a downwardly bent lip 51, this portion extending over a given area tank and for the full length thereof to eliminate the possibility of splashing any of the material 20 out of the tank, to serve as a stop when abutted by the plate 30 of the elements in one direction and to serve as a stop when adapted by the locating elements 45 during their movement in the opposite direction.

Upon considering the operation of the apparatus, let it be assumed that the tank 17 is supplied with a desired material 20 to a given level, as illustrated, and that the elements 23 and 45 are in the positions shown in Fig. 2. When in these positions an article 14 may be placed upon the support 10 and moved toward the elements 45 until stopped by these elements, with the ends of the elements positioned in given apertures 21 of the article. In this manner the article is accurately located to receive the material applying elements. If, during the movement of the article into position, it should not be in direct alignment with the preferred position, the locating elements 45, through their bevelled surfaces 48, will effect a shifting of the article to bring it into the desired position. Thus through the sides of the locating elements, the article is given an accurate lateral location while the curved ends 47 of the locating elements give the article a desired longitudinal location with respect to the material applying elements 23. It is not found necessary to provide any clamping or holding means for the article once it is located. It is moved into position by one hand of the operator and is advisably held in this position in the same manner during the rotation of the shaft 34 through the aid of the crank or handle 42, to bring the elements 23 from the position shown in Fig. 2 to the position shown in Figs. 4 and 5.

During this movement of the shaft and the elements, the forward portions of all of the elements will transfer on their surfaces given quantities of the material to further transfer these quantities to the walls of their respective apertures 21. The previously described clearances between the elements and the walls of the apertures will be sufficient for the passage of given quantities of the material into the apertures, the pockets 27 carrying additional quantities of the material which will be allowed to pass through their outlets 28 at the upper portions of the walls of the apertures. Thus it is apparent that during the upward swing of an element into its aperture, all portions of walls of the aperture will be covered with the material. However, due to the fact that the elements enter the bottoms of the apertures, there may be more material applied there than at the tops. The movement of the element into the applying position is of such speed that the material in the pocket 27 will not have sufficient time to escape through its outlets until the element is in its applying position. At this time the upper portions of the walls will be supplied with more material than is necessary. This excess material will be allowed to follow the element in its downward movement out of the aperture, thus providing a double applying means, first, the application of the material on the outer walls of the element 23, and second, the application of the material brought in the pocket to the applying position and then applied in a reverse order to the walls of the aperture. This assures a clearer covering of all portions of the walls of the aperture.

Although specific improvements of the invention have been shown and described, it will be understood that they are but illustrative and that various modifications may be made therein without departing from the scope and spirit of this invention as defined by the appended claims.

What is claimed is:

1. A material applying apparatus comprising a support for an article having apertures therein, a tank for a supply of material, material applying elements having contours adapted to substantially fill the apertures, means to cause the elements to remove quantities of the material from the supply and cover the walls of the apertures therewith, and means receivable in certain of the apertures to locate the article relative to the elements.

2. A material handling apparatus comprising a support for an article having a notch therein, a tank for a supply of material, an element having an end portion with walls substantially conforming to respective walls of the notch, a pivotal support for the element, means to move the pivotal support to move the element and cause the walls of the end portion to transport quantities of the material from the supply to their respective walls of the notch, and means mounted to be supported by and be moved with the pivotal

support to enter the notch to locate the article relative to the element.

3. A material handling apparatus comprising a support for an article having a notch therein, a tank for a supply of material, an element having an end portion with walls substantially conforming to respective walls of the notch, a pivotal support for the element, means to move the pivotal support to move the element and cause the walls of the end portion to transport quantities of the material from the supply to their respective walls of the notch, and means mounted to be supported by the pivotal support and receivable in the notch to locate the article relative to the element.

4. A material handling apparatus comprising a support for an article having a notch therein, a tank for a supply of material, an element having an end portion with walls substantially conforming to respective walls of the notch, a pivotal support for the element, means to move the pivotal support to move the element and cause the walls of the end portion to transport quantities of the material from the supply to their respective walls of the notch, and a member mounted to be supported and moved by the pivotal support so that an end thereof is receivable in the notch when the end portion of the element is in the supply to locate the article relative to the element.

5. A material handling apparatus comprising a support for an article having a notch therein, a tank for a supply of material, an element having an end portion with walls substantially conforming to respective walls of the notch, a pivotal support for the element, means to move the pivotal support to move the element and cause the walls of the end portion to transport quantities of the material from the supply to their respective walls of the notch, and a member carried by the element and extending at right angles with respect thereto to position the outer end of the member a distance from the said end portion of the element to enter the notch to locate the article relative to the element prior to the movement of the end portion of the element into the notch.

6. A material handling apparatus comprising a support for an article having spaced apertures therein, a tank for a supply of material, material applying elements having contours adapted to substantially fill the apertures, means to support the elements for rotation about a given axis for movement of like ends of the elements from the supply to move quantities of the material therefrom through arcuate paths into their respective apertures to cover the walls thereof with the material, and a member secured at the ends of the elements to engage the article and stop movement of the said ends through the apertures.

7. A material handling apparatus comprising a support for an article having spaced apertures therein, a tank for a supply of material, material applying elements having contours adapted to substantially fill the apertures, means to support the elements for rotation about a given axis for movement of like ends of the elements from the supply to move quantities of the material therefrom through arcuate paths into their respective apertures to cover the walls thereof with the material, and a member mounted to be supported by the supporting means and having its outer end spaced from the said ends of the elements and positioned to enter one of the apertures when the ends of the element are in the supply to locate the article relative to the elements and movable with the elements out of the said aperture during movement of the elements from the supply and into their apertures.

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