April 19, 1932. C. BAUER 1,854,878

PASTING MACHINE

Original Filed Dec. 22, 1927 3 Sheets-Sheet 1

Fig. 1

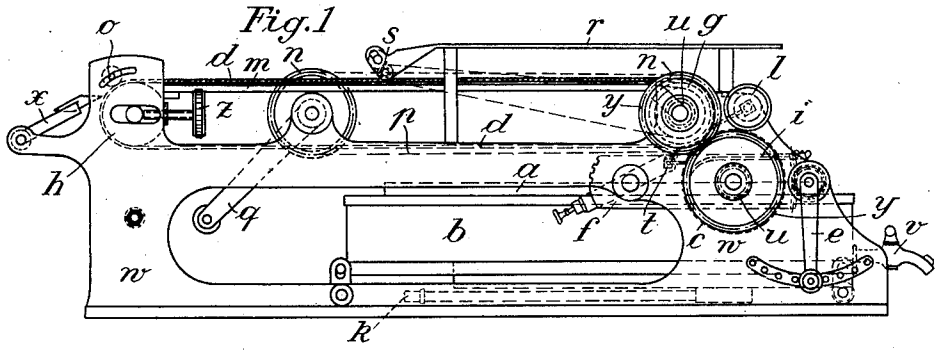



Fig. 2

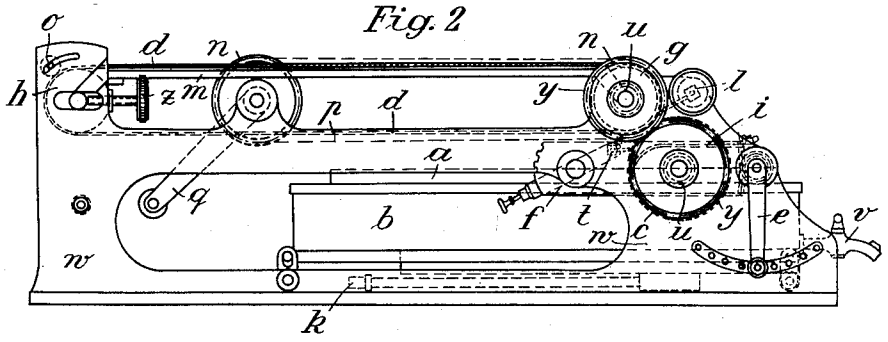
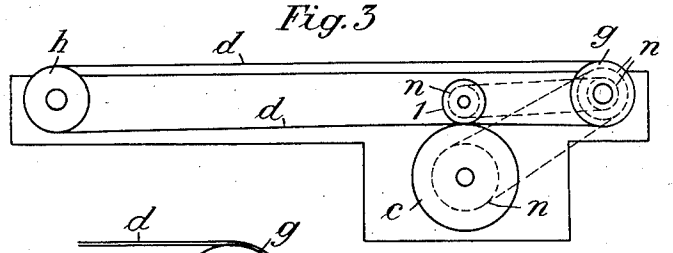



Fig. 3



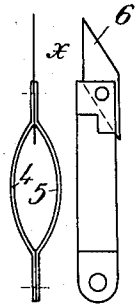




Fig. 7

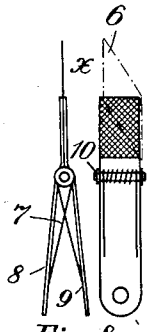



Fig. 8

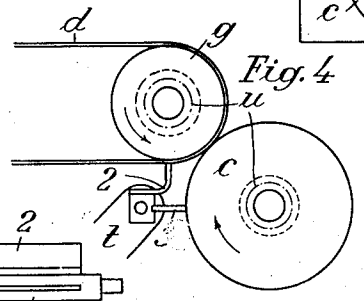



Fig. 4

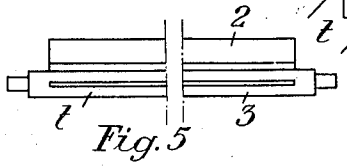



Fig. 5

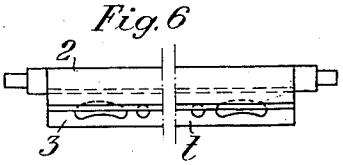



Fig. 6

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April 19, 1932. C. BAUER 1,854,878

PASTING MACHINE

Original Filed Dec. 22, 1927 3 Sheets-Sheet 2

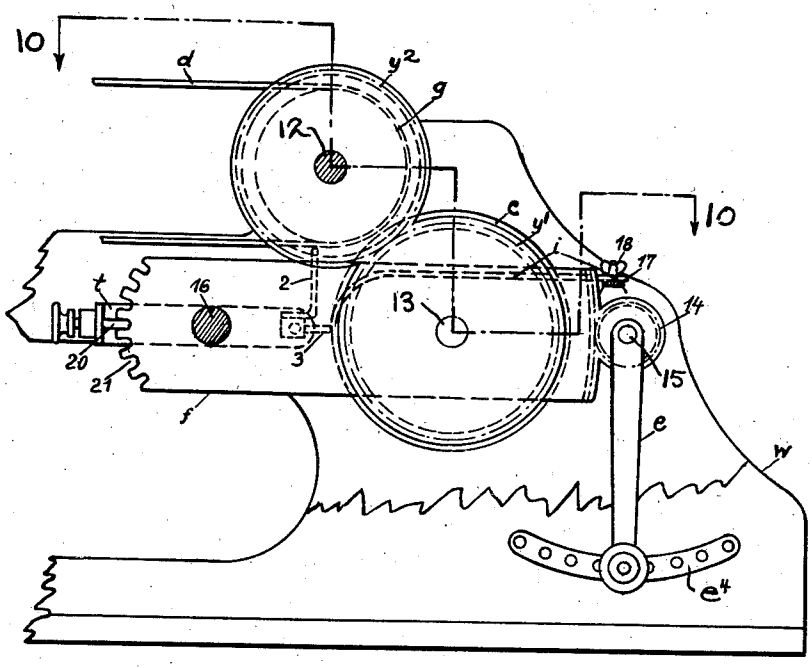


Fig. 9

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April 19, 1932. C. BAUER 1,854,878

PASTING MACHINE

Original Filed Dec. 22, 1927 3 Sheets-Sheet 3

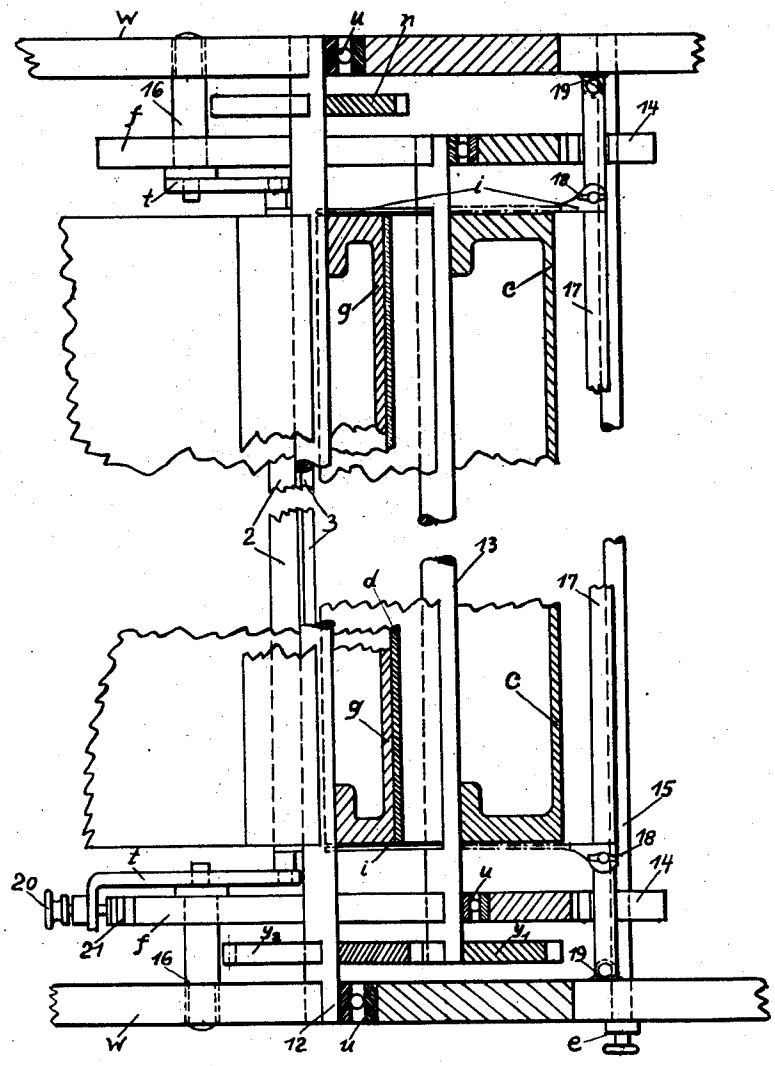


Fig. 10

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1,854,878

# UNITED STATES PATENT OFFICE

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## PASTING MACHINE

Application filed December 22, 1927, Serial No. 241,822, and in Germany December 27, 1926. Renewed September 22, 1931.

The present invention relates to a pasting machine that also provides a travelling application board for applying fluids of all kinds to paper, linen fabrics, velvet, plush, cardboard and leather. The fluids are transferred by means of a transfer roller to a horizontal conveyor band the length of which is so adjusted that the coating or application surface is reduced to a minimum. The conveyor band has various double centimetre lengths and single centimetre widths and is perfectly smooth on both surfaces, it is endless without seams and runs over a metal plate so that the upper operative surface has a rigid support. At the delivery end the conveyor band is raised to a height of 3 millimetres which is effected by inserting a second bevelled metal plate and above the forward half of the band is fitted a laying-on table that is provided with two rollers arranged at an acute angle for feeding the material which is to be pasted and which is thus carried to the pasting path. Lifters fitted with rubber lifting points are arranged at the end of the pasting path and above the lifters an additional pressure roller is adjustably mounted in order to allow for material of any thickness running out under uniform pressure and control.

By removing the laying-on table the machine can also be used as a so-called travelling application board. This has the advantage of always providing a flat path coated with fresh paste, because owing to the continuous slow rotation of the band the surface from which the paste has been drawn off disappears and a surface with fresh paste thereon appears.

In the earlier pasting and gumming machines, with single or several rollers, the material is fed by means of two feed rollers to the actual pasting roller. A pressure batten is arranged between the pasting roller and the feed rollers but the material which is to be pasted usually remains suspended between the feed rollers, if it is not smooth or if the feed rollers absorb moisture from the hot paste, because the feed rollers are situated immediately over the hot paste box and remain in a heated condition even if a protective sheet of metal be inserted underneath. Fabrics such as velvet, plush, moleskin and other unpasted materials used for binding books cannot be satisfactorily conveyed. When the material passes round the shallow convex surface of the pasting roller it remains suspended on the sharp brass points of the lifters. Bookbinders and cardboard cutters who still use the existing types of pasting machines have invariably a quantity of waste material left on hand. If the travelling pasting roller be used with these pasting machines as a finishing or drawing-off device, the material must be changed by hand, but the shallow convexity which is only one-third of the circumference of the pasting roller militates against this, because particularly narrow strips invariably either slip or are diverted laterally.

The present invention eliminates this defect as the fluid is conveyed or transferred by means of a transfer roller on to the horizontal band. The distance of the transfer roller from the band can be adjusted so that the fluid is applied uniformly in any desired thickness of layer. The material which is to be damped with the fluid is fed to the conveyor band from a laying-on table and runs quite flat until it reaches the lifter roller. Two feed rollers are fitted to the laying-on table which are driven by friction and hold the material down from the moment it is fed in. At the delivery end is arranged an adjustable roller which holds the material down uniformly as it runs out so that the ends of the material receive a sufficient supply of fluid. The laying-on device is placed at such a distance from the actual fluid container that none of the steam rising from the hot fluid container can reach the feeding and conveying members. For special methods of working the present invention provides a heating device for the lower half of the horizontal band so that the hot paste does not cool if the band with its surface of paste stands still for any length of time. However the same object can be attained by having a sufficiently large fluid container.

The machine according to the present invention is such that the laying-on table can

be removed, as also can the lifters; after these parts have been removed, the machine can be used as a so-called application board. As in the case of an ordinary application board every kind of material can be moistened with paste by the apparatus described the only difference being that fresh paste need never be applied by means of a brush because the travelling band always automatically brings fresh paste to the upper surface. Underneath the travelling band is a scraper which, as may be required, not only conveys the paste that has not been drawn off back into the container but also serves at the same time to clean the band. A few centimetres behind the scraper fresh paste in any desired thickness of layer is fed to the transfer roller. Above the transfer roller viewed from the front of the machine a second scraper is arranged which acts as a supplementary regulator and merely allows a very fine layer of paste on the coating band. The band makes on an average ten revolutions per minute which however can be increased if desired, according to the nature of the work in hand, by means of differential wheels and regulating switches. The rollers which are connected to toothed wheels run in ball bearings. For working up the paste, the present invention makes provision for the band to be manually driven. The thickness of the coat having been adjusted, one and one only complete revolution is effected and the coated band is then filled up with about thirty or more strips of paper, such as are used for example in cigar factories; the strips are then removed one by one to be worked up, and the process repeated as often as may be required. The same operation can also be effected in other departments, where small pieces of material are to be moistened with paste, glue, gelatine or any impregnating matter. Frame mounts and fabrics can also be moistened with adhesive material rapidly and uniformly in this manner. Moreover by means of the present invention material can also be moistened with adhesive matter, material which on one side is smooth but has uneven places on the other side, for example, decorative coatings, the material being laid flat on to the band and pressed on gently by hand. Fluids which have to be applied in the hot state are maintained at any desired temperature by means of gas heating, electric heating, or by means of a hearth heated with hot ashes. The drive of the machine can be effected by hand, shafting, or from a separate motor; if a motor is used, the machine and the motor are mounted on one and the same base plate.

The subject matter of the present invention is more clearly explained by means of the constructional form illustrated by way of example in the accompanying drawings.

Figure 1 is a side view of the combined machine, all the adjustable parts being shown diagrammatically.

Figure 2 is a similar side view with the laying-on table and the lifters removed.

Figure 3 is a modification of the machine shown in Figures 1 and 2.

Figure 4 shows the embedded cleaning apparatus to a larger scale and in the cleaning position close up to the transfer roller and the conveyor or coating band.

Figure 5 shows the vertical position of the cleaning apparatus as seen from below.

Figure 6 shows the horizontal portion of the cleaning apparatus with the drainage holes seen from the front turned towards the transfer roller.

Figure 7 shows the lifters provided with rubber points and comprising two leaf spring clamps.

Figure 8 shows an alternative form of lifters with spiral spring clamps.

Fig. 9 is an enlarged elevation, partly in section, of the means for regulating the transfer roller and the scraping device, the near wall of the frame being broken away.

Fig. 10 is a section on the line 10—10, of Fig. 9.

In Figure 1 *a* is the fluid container which is surrounded by a water jacket *b*. The transfer roller *c* dips into the fluid container *a*. The coating belt *d* runs above the transfer roller *c* and by means of distance pieces on either side the thickness of the layer to be transferred to the coating belt is determined from time to time by operating the lever *e*, which is connected to a toothed segment and pinion and is an adjusting lever with a rigidly coupled toothed wheel and is moved over the arc $e^4$. *f* is a bearing member with a toothed segment, the second lever *t* secured thereto passes over a perforated scale. *g* and *h* are conveyor rollers with supporting discs for the horizontal conveyor band or coating belt *d*. *i* are lateral scrapers bearing against the surface of the transfer roller. *k* is a union for connection to a gas supply or an electric heating device can be connected up at this point. *l* is the paste or glue distributor for extremely fine coatings. *m* is a metal plate disposed between the conveyor rollers *g* and *h* and represents a rigid support for the coating belt. *n* is a toothed wheel on the handle side. *o* is an adjustable pressure roller for holding both rigid and elastic materials down on the pasted band. *p* is a chain for the toothed wheel conveyor when operated manually. *q* is the handle. *r* and *s* are the laying-on table and feed rollers, both being connected in such a manner that these parts can be simultaneously removed showing the machine as represented in Figure 2 and as used only as an application board. The feed rollers are frictionally connected together. *t* is the cleaning apparatus for the coating belt and transfer roller. *u* are ball

bearings. *v* is a cock for rapidly emptying the water bath *b*. *w* is the wall of the frame. *x* are lifting bodies made of metal with interchangeable rubber points. *z* are setting or tension screws.

In Figure 2 the machine is shown as a travelling application board with the same parts, with the exception of the laying-on table *r* and the feed rollers *s* that have been removed, the operation is otherwise the same as that of the machine shown in Figure 1.

Figure 3 is a modification of the machine shown in Figures 1 and 2. A special guide roller 1 is provided in Figure 3, in order to prevent any deviation of the coating band, the remaining parts are the same as that of the machines shown in Figures 1 and 2.

Figure 4 shows, to an enlarged scale, the vertical cleaning member connected to a horizontally disposed second cleaning batten. 2 shows the cleaning position of the coating band, 3 that of the cleaning position of the transfer roller.

Figure 5 is the elevation at 2 in Figure 4.

Figure 6 is the ground plan at 3 of Figure 4. The circular and oval holes serve to carry away the paste or glue.

Figure 7 shows lifters with lifting points; the lifters consist of leaf spring clamps (made of metal), the points being made of vulcanite. 4 and 5 are similar parts of the clamps, 6 showing the inserted lifting point. The parts are marked *x* on the machine.

Figure 8 shows lifters with spiral spring clamps. 7 and 10 are the springs which are connected to the cheeks 8 and 9 and into which the point 6 is pressed by means of a spring.

As shown in Figs. 9 and 10, the opposed bearing members *f* are journaled on stud bolts 16 which are screwed into the opposite walls *w* of the frame. Meshing with the toothed segments of members *f* at the right hand end (Fig. 9) are pinion wheels 14 mounted upon a shaft 15 which shaft is journaled in the opposite walls *w* of the frame. Shaft 15 carries at one end a lever *e* by means of which the pinions 14 may be rotated to pivot the bearing members *f* on studs 16. Lever *e* may be held in adjusted position by a pin engaging notches in the arcuate guide $e^4$. Journaled in ball bearings *u* in the members *f* is a shaft 13 disposed parallel with shaft 15 and carrying the transfer roller *c*. Shaft 13 also carries a toothed wheel $y^1$ which meshes with the toothed wheel $y^2$ of the shaft 12 of the conveyor roller *g*. The shaft 12 is journaled in ball bearings *u* in the opposite walls *w* of the frame. The scrapers *i* are screwed by wing screws 18 on a bar 17 which is fastened to eyes 19 on the opposite walls *w* of the frame. On extensions of the bolts 16 are rotatably journaled the arms *t* of the scraper having the bars 2 and 3 for cleansing and scraping. Scraper arms *t* are held in adjusted position by bolts 20 engaging the spaces of teeth 21 in the ends of the bearing members *f*.

The operation of the machine is as follows;—Handle *q* when rotated revolves the shafts of both toothed wheels *n*, which wheels are driven in unison by chain *p*. Rotation of wheels *n* moves the belt *d* which runs over drums *g* and *h*, and also rotates distributor roller *c* by means of gearing *y*. Instead of crank handle *q* a small electric or other motor could be used to operate the machine. The paste in tank *a*, which may be heated by means of jacket *b*, is transferred to the coating belt *d* by the transfer roller *c* which dips into the paste in tank *a*, the roller *c* rotating in a clockwise direction as shown by the arrow in Fig. 4. The upper run of belt *d* moves from right to left as shown by the arrow on drum *g* in Fig. 4. The thickness of the layer of the paste thus transferred to the belt *d* is regulated by operating lever *e*, also by adjusting the lateral scrapers *i* against the surface of the roller *c*. Manipulation of distributor *l* will permit a very fine coating to be spread upon the belt *d*. The sheets or strips, to which paste is to be applied, are fed upon the top run of belt *d* from the laying-on table *r* between the driven feed rollers *s*. The sheet is then carried by the belt *d* supported upon the table *m* to and under the delivery roll *o* which holds the sheet down upon the paste band *d*, and the sheet then passes over the lifters *x* which deliver the pasted sheet. The laying-on table *r* including feed rollers *s* can be bodily removed (Fig. 2) when the machine is to be used as a travelling application board and likewise the lifters *x* can be removed. The scraper *t* which contacts with the under run of belt *d* removes from belt *d* any paste which has not been used. Fresh paste of desired thickness is again applied by roller *c* adjacent but slightly beyond the scraper *t*. Scraper *t* can also be adjusted for cleaning the transfer roller *c* (as at 3, in Fig. 4).

I do not limit my invention to the exact forms shown in the drawings for obviously changes may be made therein within the scope of the claims.

What I claim is:—

1. A pasting machine comprising a paste tank, a support; an endless belt running over said support; a transfer roller adjacent the belt and dipping into the tank and adapted to distribute paste upon the belt; and means for adjusting the roller to regulate the thickness of the paste distributed on the belt.

2. In a pasting machine as set forth in claim 1, said means comprising a pivoted frame carrying the transfer roller and having a toothed segment, a pinion meshing with said segment and carrying a lever whereby as the lever is moved the frame will

be rocked; and means for locking the position of the lever.

3. In combination with a pasting machine as set forth in claim 1, a scraper disposed adjacent the conveyor belt for spreading the paste thereon into a fine layer of paste, said scraper being adjustable independently of the main adjusting device.

4. In combination with a pasting machine as set forth in claim 1, a cleaning member adjustably disposed between the transfer roller and the conveyor band and adapted to simultaneously clean the conveyor band and the transfer roller in one operation; and a lever for operating said cleaner.

5. A pasting machine comprising a paste tank, a support; an endless belt running over said support; a transfer roller dipping into the tank and adapted to distribute a layer of paste upon the said belt; and an adjustable cleaning member between the belt and roller having a portion adapted to scrape the band and having a portion adapted to scrape the transfer roller, for the purpose of removing the superfluous paste therefrom.

6. In combination with a pasting machine as set forth in claim 1, a removable laying-on table disposed above the conveyor band and paste tank, and feed rollers mounted on said table in such position as to be protected from the heat of the paste tank.

7. In combination with a pasting machine as set forth in claim 1, a pressure roller mounted in slanting guide slots adjacent the delivery end of the belt and adapted to be adjusted for rigid and elastic materials.

8. In combination with a pasting machine as set forth in claim 1, the laying-on table and guide rollers covering substantially half the length of the belt and the same being manually removable from the machine.

9. The combination with a pasting machine as set forth in claim 1, screw means for tensioning the belt.

10. In combination with a pasting machine as set forth sheet lifters comprising spring clamps mounted at the delivery end of the machine; the points of the lifters being made of vulcanite and inserted into the clamps by a slight pressure.

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