

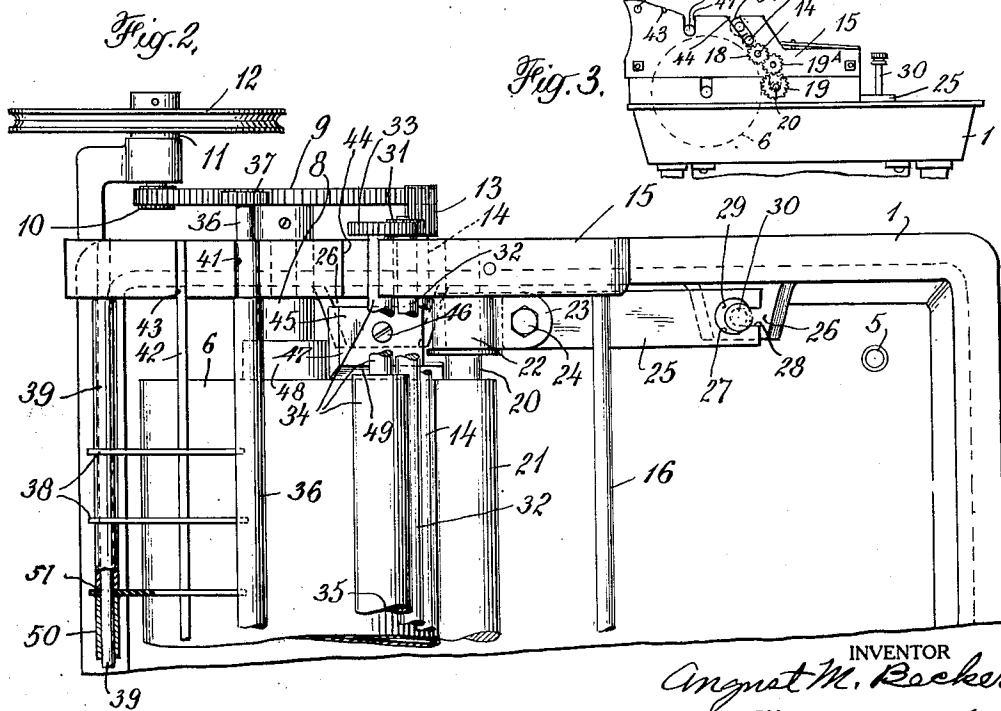
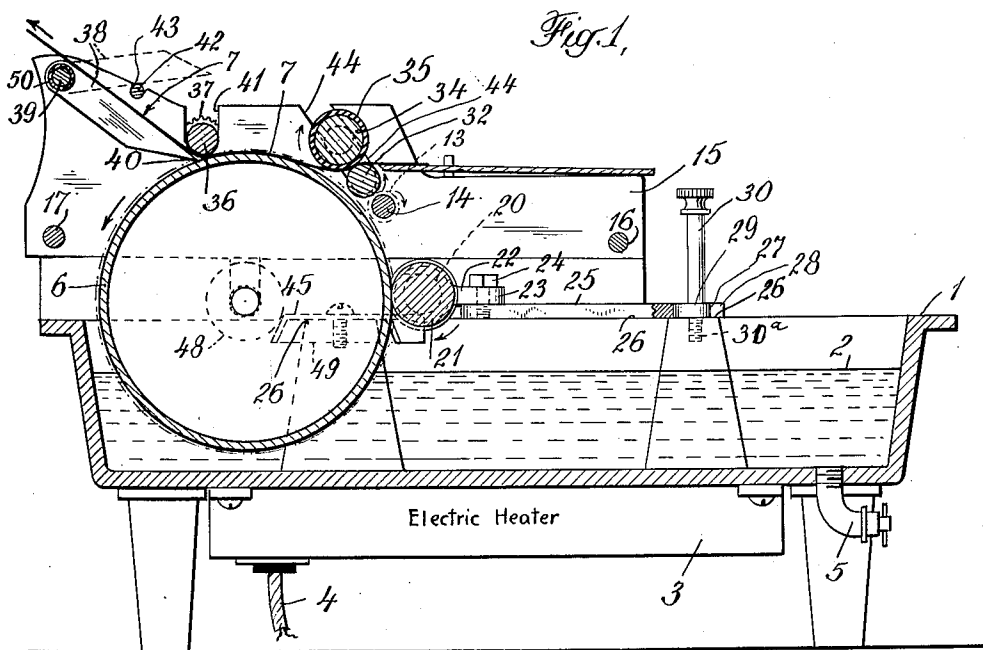
Feb. 22, 1927.

1,618,631

A. M. BECKER

MACHINE FOR COATING WEBS WITH ADHESIVE

Filed June 17, 1924



INVENTOR
August M. Becker
 BY
William Fowler
 ATTORNEY

UNITED STATES PATENT OFFICE.

AUGUST M. BECKER, OF NEW YORK, N. Y.

MACHINE FOR COATING WEBS WITH ADHESIVE.

Application filed June 17, 1924. Serial No. 720,539.

My invention relates generally to machines for applying adhesives in liquid form to the surface of a web or sheet of material, and the improvements are particularly well adapted to the type of machine shown in my U. S. Letters Patent No. 1,435,197, dated November 14, 1922, and No. 1,493,061, dated May 6, 1924, and to which reference may be had for the particular application of my present invention.

One object of my present improvement is to provide a delicate adjustment for the means by which is governed the quantity of adhesive or thickness of its coat which is to be applied to the sheet in a given operation of the machine, while another object is to facilitate the operation of leading the coated-sheet away from the adhesive-applying drum, which sheet in some cases is of thin material while in other cases is heavy and less flexible. Another object is to adapt the machine for use with webs or strips of material of varying widths up to the full capacity of width of the machine. Another object in view is to simplify the means for preventing the adhesive-distributing drum, as well as the doctor-roll co-operating therewith, from becoming clogged at the ends with an accumulation of surplus adhesive which accidentally occurs at these places. With these and other objects in view, my inventions consist in the various novel and peculiar arrangements and constructions of the several different parts of the apparatus, all as more fully hereinafter pointed out in the claims, after being set forth in the description and illustrations accompanying the same.

I have illustrated a type of my invention in the accompanying drawings, wherein;

Figure 1 is a view of a vertical cross-section of a machine embodying my invention.

Fig. 2 is a top plan view of one end of the machine shown in Fig. 1, with part thereof broken away.

Fig. 3 shows in elevation part of the end of the machine, opposite to that shown in Fig. 2, including the gears for driving the doctor-roll.

Referring to the drawings, 1 indicates a receptacle or tank for holding the adhesive material 2, which is kept in a warm or suffi-

ciently heated condition by an electric-heater 3, of any well known type, which may be secured to the under-side of the bottom of the tank and is supplied with electric-current by a suitable connection 4, or if preferred any portable and removable electric-heater of well known type may be placed beneath the bottom of the tank to keep the adhesive material warm. The bottom of the tank 1, is provided with a valved drain-cock 5, for drawing off the liquid adhesive whenever desired.

A rotary adhesive-distributing drum or cylinder 6, is mounted in the tank, so that the lower part of the drum constantly dips in the adhesive, whereby the rotation of the drum causes it to lift a quantity of the adhesive and carry it upwardly in a thin coating and transfer the adhesive in a layer to the under-side of the web or sheet of material 7, which is moved transversely across the upper surface of the drum in close contact therewith for this purpose.

The shaft or arbor 8, of the drum 6, which is provided with suitable bearing in the sides of the tank, has secured to one end thereof and to the exterior of the tank, a large driving-gear 9, which may be driven in any suitable manner and which I here show as being driven by a pinion 10, on a shaft 11, operated by a belt-wheel 12, which may be driven in any suitable manner.

The driving-gear 9, meshes with and actuates an elongated pinion 13, fixed on the shaft 14, journaled in the side-members 15, of the demountable frame structure which is made up of said side-members and the tie-rods 16, and 17. To the other end of shaft 14, is secured a gear-wheel 18, disposed to the exterior of the adjacent side-member 15, and in mesh with an idle-gear 19^a, which drives a gear 19, fixed to the end of the arbor 20, on which is secured the doctor-roll 21, the respective ends of which arbor are journaled in the horizontally adjustable brackets 22, which are constructed alike and have similarly arranged and constructed adjusting means. The journal brackets 22, are each provided with an ear 23, pivoted at 24, to the inner end of a bar 25, and both the bracket and bar lie in contact with the shoulder or ledge 26, cast on the inside of the tank 1, and slide in such contact lengthwise the

bar so that the periphery of the doctor-roll 21, may be adjusted relatively to that of the adhesive-distributing drum 6, with which it makes contact throughout its length. Each
5 adjusting-bar 25, is provided with a vertical circular opening or socket 27, open at one side at 28, for the reception of a cam-disk 29, fitting somewhat loosely therein and provided with an eccentrically disposed stem
10 30, having its lower end fitted into a screw-threaded socket 30^a, formed in the shoulder 26, and its outer end provided with a milled head for turning the stem back and forth with the fingers in effecting the adjustment
15 of the doctor-roll. This eccentric link or bar arrangement provides a ready and delicate adjusting means for regulating the pressure between the doctor-roll and the adhesive-distributing drum, for the purpose of
20 regulating or gaging the thickness or quantity of adhesive film carried beyond the contact line of the doctor-roll with the drum and thereby control the quantity of adhesive which the drum applies to the under
25 surface of the sheet of material 7, as it is passed over the surface thereof, in the manner shown in Fig. 1. The eccentric-link 25, may be placed in operative position after the stem 30, is secured in its socket, by passing the notch 28, over the stem until the
30 eccentric disk enters the opening 27, and then entering the pivot bolt 24, through the perforation in the ear 23, and screwing its threaded end into the threaded socket in the link, as will be understood from Fig. 1.
35 This arrangement permits of the doctor-roll being quickly removed whenever it may be desired and quickly re-mounted in its operative position. When the doctor-roll is driven
40 through the described connection of the shaft 14, gears 18 and 19, its direction of rotation is opposite to that of the adhesive-distributing drum, as indicated by the arrows in Fig. 1.
45 The pinion 13, drives a gear-wheel 31, fixed on the end of feed-roll 32, and said gear wheel 31, actuates a gear wheel 33, which is secured to the end of the other feed-roll 34, the two feed-rolls being mounted
50 across the side-members 15, of the upper frame structure so as to lie in contact with each other and they are rotated in opposite directions for effecting the feed of the sheet of material 7, between them. The upper
55 feed-roll 34, is covered with a rubber jacket 35, to increase the friction between it and the sheet and give a better grip on the same to make the feeding action of the sheet more positive. The mounting of the upper roll
60 is such that it rests by gravity upon the lower roll 32, and has a floating movement with respect thereto.

The sheet 7, is fed onto the adhesive distributing drum by the feed-rolls at a point
65 somewhat below the top of the drum and

passes over a sufficient portion of the periphery thereof to insure a good coat of the adhesive being transferred to the sheet which is engaged by a guide-roll or bar 36, which is spaced from the periphery of the drum
70 by a very small distance equal about to the thickness of the coated sheet. This insures a uniform coat of the adhesive being applied to the sheet and the heaviness of the coat or quantity of adhesive thus presented to the sheet, is easily controlled by
75 the adjustment of the doctor-roll, the proximity of which to the drum serving to regulate the quantity of adhesive forming the coating. The guide-roll 36, is rotated by a
80 gear-wheel 37, secured to its outer end and in mesh with the large-gear wheel 9, of the drum, so that it rotates in the opposite direction. The guide-roll 36, is mounted in suitable bearings in the side members of the removable frame structure.

After passing under the guide-roll 36, the coated sheet 7, is moved onto the series of inclined swinging guide-fingers 38, which
90 are mounted to swing on the rod 39, which is secured in horizontal position between the side-members 15, and serves also as part of the removable frame structure. The fingers 38, which swing in the vertical plane have their
95 free ends beveled at 40 on the under side thereof and they are long enough to have their ends rest upon the periphery of the drum 7, at points below the guide-roll 36, so that the coated sheet 7, may be readily
100 passed from the drum, upwardly to the inclined fingers and beyond the pivoted ends of the same, where the operator may grasp the sheet and draw it away. The guide-fingers are arranged at suitable intervals
105 apart along the length of the drum and any number of them may be placed in operation as desired. For example, if the sheet 7, is quite narrow and but two of the guide-fingers are required, the idle ones may be lifted
110 from contact with the drum, by first lifting the guide-roll 36, from its bearings which are notched at 41, for that purpose, and then inserting beneath the raised fingers, a supporting wire or bar 42, the ends of which
115 rest in notches 43, formed in the upper edge of the side-members 15. This arrangement saves the idle guide fingers from being unnecessarily brought in contact with the adhesive material on the surface of the drum.

In mounting the two feed-rolls 32 and 34,
120 in place, I provide the inclined notches or slots 44, in the side-members 15, of the demountable frame structure, and the journals at the respective ends of these rolls lie in these notches, so that the rolls are readily removable.

A sheet-metal scraper 45, preferably of resilient metal, is detachably mounted on the ledge 26, within the receptacle 1, by means of
130 a screw 46, and a flange 47, at one end there-

of, engages the periphery of the cylindrical enlargement 48, on the shaft of the distributing-drum 6, and this keeps the bearings of said shaft practically free from an accumulation of the adhesive, because of the scraping action of the flange at this point. A flange 49, along the length of the scraper acts against the end of the drum so as to remove therefrom the adhesive which may find its way there, and this further safeguards the journal bearings of the drum from accidental accumulation of the adhesive.

The swinging guide-fingers 38, are spaced apart on the rod 39, by means of loose sleeves 50, the fingers being placed on the rod by passing the same through the orifice 51, in the end of the fingers.

I wish to be understood as not limiting my invention to the particular constructions herein shown of the several different parts, as it is evident that various modifications may be made in the same, without, however, departing from the spirit of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a machine of the class described, an adhesive distributing roll provided with a driving-gear and means for driving it, a pair of feed-rolls each provided with a gear-wheel engaging each other, and an elongated pinion in mesh with and driven by the driving gear of said distributing-roll and engaging and driving the gear-wheel of the lowermost feed-roll, the upper feed-roll of said pair being mounted so as to float.

2. In a machine of the class described, a rotating adhesive-applying drum and a co-operating doctor-roll, a transversely movable bearing for each end of said doctor-roll for adjusting it relatively to said drum, a bar attached to each of said bearings and provided with a circular recess, a cylindrical member mounted to turn in said recess and having an eccentric axis of rotation, and means for turning said member in said recess in either direction to adjust the connected bearing.

3. In a machine of the class described, a rotating adhesive-applying drum, feed-rolls for introducing a web to the periphery of said drum, a driven web-guide roller disposed at the stripping point and parallel with and closely adjacent to the said drum, and web-stripper or guide fingers engaging the periphery of said drum beneath said web and said web-guide roller.

4. In a machine of the class described, means for receiving and applying adhesive material to a web as a coat, adjustable means for regulating the thickness of the coat to be applied, said adjusting means comprising a rotatable stem provided with an eccentric, an adjustable member provided with a circular opening in which said eccentric is dis-

posed, said opening being provided with a lateral passage to permit the stem to be entered and withdrawn through the same.

5. In a machine of the class described, means for applying a film of adhesive to one side of a web, and an adjustable doctor-roll for regulating the thickness of the applied adhesive-film, a laterally sliding bearing at each end of said doctor-roll in which the ends of the roll are journaled, each of said bearings being provided with a lug, an eccentric-link pivoted to each lug for effecting the transverse adjustment of the doctor-roll.

6. In a machine of the class described, an adhesive distributing roll provided with a driving-gear and means for driving it, a doctor-roll parallel with and engaging the periphery of said distributing-roll and provided at one end with a cog-wheel, a pair of feed-rolls provided at one of their ends with intermeshing gear-wheels, an elongated pinion provided with a counter-shaft driven thereby, said pinion being in mesh with and driven by the driving-gear of said distributing-roll and engaging and driving the gear-wheel of one of said feed-rolls, said counter-shaft being provided at its other end with a toothed-wheel and an idler gear intermediate the same and the cog-wheel of the doctor-roll.

7. In a machine of the class described, means for applying a film of adhesive to the side of a web, a series of depending guide-fingers swinging on a horizontal axis and constructed and arranged to be swung into and out of engagement with said adhesive applying means to lead the coated web therefrom, and a removable rest for receiving and supporting the free ends of said guide-fingers when swung out of engagement with said adhesive-applying means.

8. In a machine of the class described, an adhesive distributing roller provided with a gear-wheel and means for driving it, a pair of feed-rolls for feeding the web onto the periphery of said distributing-roller and provided with intermeshing gear-wheels geared to and driven by said roller gear-wheel, said feeding-rolls being arranged horizontally on different levels with the uppermost roll resting by gravity against the other and disposed nearer the distributing-roller than the other, the said rolls having their ends provided with bearing-journals, fixed side members provided with slots inclined in a direction tangent to the periphery of said distributing-roller, the said bearing-journals of the said feed-rolls resting loosely in said inclined slots, the inclination of the slots acting to check the free movement of the uppermost roll away from the lower.

9. In a machine of the class described, means for receiving and applying adhesive

material as a coat to a web, adjustable means for regulating the thickness of the applied coat and comprising a horizontally adjustable member provided with a circular hole, a 5 rotatable stem provided intermediate its ends with an eccentric fitting in said hole so as to turn therein and having one end threaded, and a part having a threaded-socket in which the threaded end of said adjusting stem is mounted in operative position, the turning of said stem in said threaded-socket serving to move said adjustable member. 10

In testimony whereof, I have hereunto set my hand.

AUGUST M. BECKER.