

May 29, 1934.

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1,960,647

METHOD OF AND APPARATUS FOR PRODUCING INK TRANSFER MEMBERS

Filed Oct. 8, 1930

2 Sheets-Sheet 1

Fig. 1.

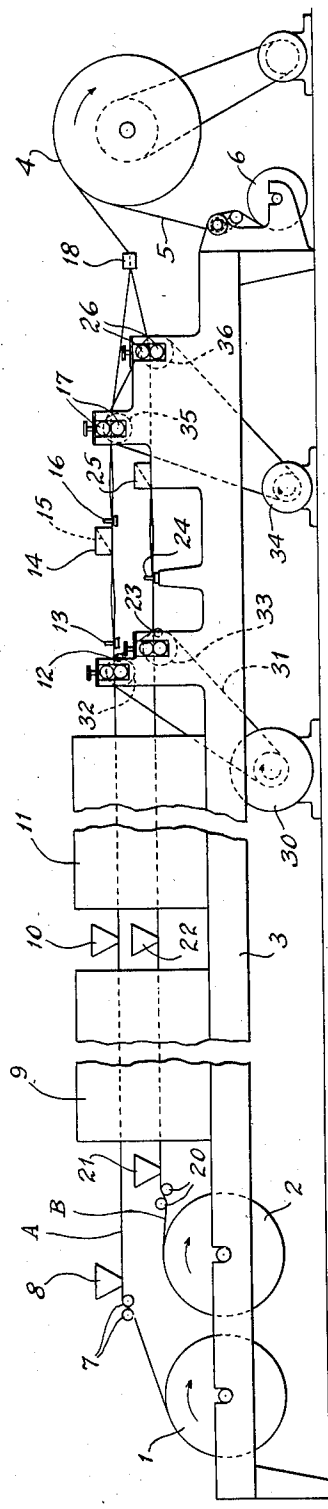


Fig. 3.

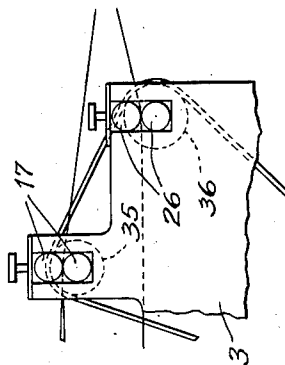
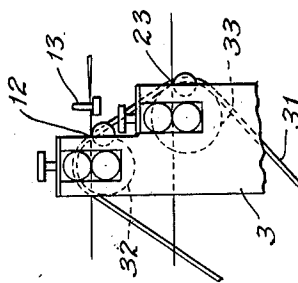


Fig. 2.



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Fig. 4.

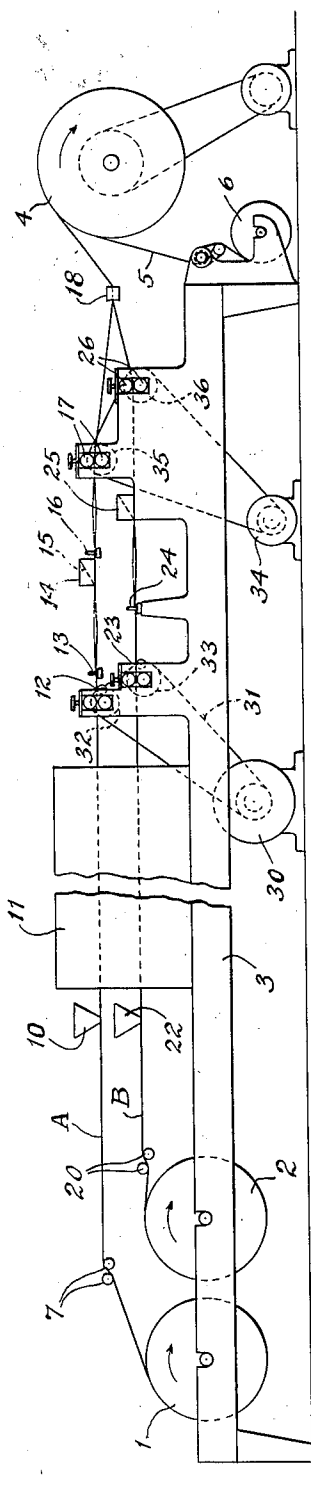
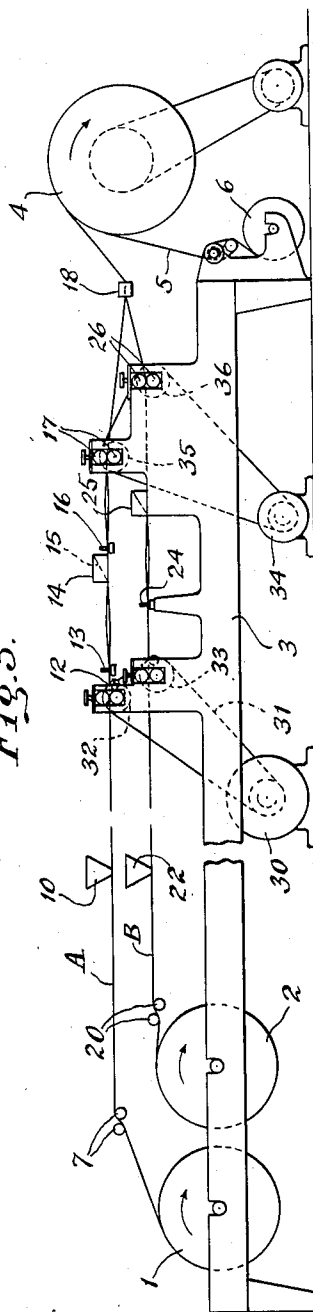


Fig. 5.



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METHOD OF AND APPARATUS FOR PRODUCING INK TRANSFER MEMBERS

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Application October 8, 1930, Serial No. 487,308

17 Claims. (Cl. 91—70)

My invention relates to methods of and apparatus for producing ink transfer members.

It has among its objects to provide improved methods of and apparatus for producing ink transfer members of various kinds, including those having ink retarding surface coatings or films and, more particularly, for producing typewriter ribbons, including those having ink retarding surface coatings or films and including various kinds of inked ribbons used on typewriters and other typing machines. One object of my invention is to provide an improved method of and apparatus whereby ink transfer members of superior quality and of the various kinds described and claimed in my Patent 1,732,187, may be inexpensively produced in quantity production. These and other objects and advantages of my improved construction will, however, hereinafter more fully appear.

In the accompanying drawings, I have shown diagrammatically for purposes of illustration, three embodiments of equipment adapted to carry out my improvements.

In these drawings,—

Figure 1 is a diagrammatic side elevation of the complete mechanism, with certain of the frame and other elements omitted to facilitate illustration;

Figure 2 is an enlarged diagrammatic view of the slitter mechanism;

Figure 3 is a similar view of the roll mechanism;

Figure 4 is a view similar to Figure 1 showing a modified construction, and

Figure 5 is a similar view showing a modified construction.

In this illustrative construction shown in Figures 1 to 3, it will be observed that I have shown a continuous mechanism longitudinally disposed and operative upon fabric fed from rolls at one end of the device in such manner that the ribbons are produced and suitably wound in rolls at the opposite end of the device.

Considering the structure generally, it will be observed that a plurality of wide fabric rolls 1 and 2 is provided and herein suitably journaled in parallel relation on one end of a frame 3 with the roll 1 inside the roll 2. It will also be observed that the fabric, which may be of any suitable silk, cotton or other material described in my previously mentioned patent, is fed from these rolls horizontally along the frame with the fabric A from the roll 1 disposed above that B from the roll 2. It will also be noted that both fabrics A and B are acted upon by im-

proved means hereinafter described in their passage along the frame 3, in such manner that each fabric is coated with a cellulose derivative and ink on one surface and ink on the other surface and also slit into the desired ribbon widths and otherwise treated. Attention is also directed to the fact that both sets of ribbons thus produced are finally wound on a roll 4 with their inked faces together and the several layers on the roll spaced apart by paper 5 (substantially non-absorbent and incapable of reducing the ink content of said ribbon) fed from a suitable underlying paper roll 6.

More particularly considering the course of the fabric from the roll 1, it will be noted that the same first passes from the latter roll to and between suitable guides 7 and horizontally therefrom. It will also be observed that after passing between these guides 7, the fabric is passed under a cellulose hopper 8 adapted to apply to the upper surface of the fabric a coating of a cellulose derivative such as described in my previously mentioned patent. After thus being coated, the fabric passes to an oven 9, preferably of substantial length, as, for example, 45 feet, so that the solvent in the coating material may be completely evaporated. After passage through this oven 9 the fabric passes under an ink hopper 10 which supplies to its upper surface a heavy bodied thick, slow-flowing ink adapted to give the utmost clearness of color. After receiving this ink coating, the fabric next passes to another elongated oven 11 substantially corresponding to the oven 9 and acting to dry the ink coating. Thereafter the fabric next passes to a slitting machine indicated at 12 which slits the fabric into the desired ribbon widths. This slitter may be of any suitable type, but is preferably a standard Cameron slitting machine of the type wherein gum is fed to the slitting knife edges in such manner as to produce a non-ravelling edge, and wherein also, as usual in such machines, an electrically heated roll is provided acting upon the slit fabric as it emerges from the slitting machine. After its passage from the slitting machine 12, the slit fabric next is turned over or reversed. Herein, it is passed through a series of adjacent upstanding deflecting pins 13 adapted to reverse the fabric, although it will be understood that in working on a long length of fabric disposed in the machine as set forth, these pins may in certain instances be omitted, since a mere manual twist once inserted in the moving fabric will be retained and produce the desired reversal thereof without the pins. When it is reversed,

i. e. with its previously uncoated and uninked surface then uppermost, this latter surface is then inked, preferably with an ink containing quite a little oil and being a highly fluid, liquid, 5 oily, fast-flowing typewriter ribbon ink and adapted to enter the fibre and increase the life of the ribbon. Herein, it is passed under an ink hopper 14 preferably of the type having a scraper 15 therein. Thereafter, the fabric is again reversed either by a series of reversing pins 16 corresponding to the pins 13 previously described, or manually. After this reversal, it next passes through a series of pull rolls 17 and through an apertured guide 18 to the roll 4 on which it is 10 wound with the wet surface last coated with ink toward the roll, and the surface first coated with ink retarding material and then with ink and subsequently dried, on the outside of the roll.

Next considering the fabric from the roll 2, it will be noted that the same first passes through guides 20 corresponding to the guides 7 and under a coating hopper 21 corresponding to the hopper 8 and thereafter through the same oven 9 previously described but at a point below and spaced 25 from the upper fabric. Thereafter the fabric is also inked with a heavy bodied thick, slow-flowing ink and baked dry as previously described in connection with the upper fabric, passing under an ink hopper 22, and also likewise passed through the oven 11 under the upper fabric and substantially spaced therefrom. Thereafter, the lower 30 fabric also passes through a slitting machine 23 similar to the machine 12 previously described and having the same function, the machines 12 and 23 herein being connected by a common chain and driven from a single motor. Upon emerging from this machine, the lower fabric is then reversed either by means of a series of pins 24 corresponding to the pins 13 or manually, and after 40 reversal is then inked by ink of the same character applied by the ink hopper 14, passing under a similar hopper 25 having a similar scraper. From this hopper the lower fabric then passes to pull rolls 26, similar to the pull rolls 17 and herein operably connected by a chain with the rolls 17 and driven from the same motor. From these rolls, it is deflected upward and through the guide 18 previously described so that its wet surface, inked by the hopper 25, is brought upward 50 into engagement with the surface of the upper fabric inked by the hopper 14 and wound with that fabric on the roll 4, with the wet oily, inky surfaces together and the opposite dry cellulose coated and inked surfaces of the fabrics outside and spaced from one another by the paper 55 drawn off the roll 6.

In connection with the drive of the slitting machines and rolls, it will be noted that herein I have shown the slitting machine 12 and slitting machine 23 to be driven from the same motor 30 60 beneath the frame 3 through a chain 31. It will also be observed that this chain drives a machine operated driving member 32 on the machine 12 which is rotated with a slightly faster surface speed than a corresponding member 33 driven by the chain 31. Similarly, it will be observed that the rolls 17 and 26 are driven from a single motor 34 and that the driving member 35 of the roll 17 is driven at a slightly faster surface speed 70 than the driving member 36 of the roll 26. Attention is also directed to the fact that the driving members 32 and 35 are driven at the same surface speed with the rolls 33 and 36. Thus the slitting machine and rolls operating on the upper fabric 75 operate at the same speed, while the slitting ma-

chine and rolls operating on the lower fabric also operate at the same speed, but with a slightly lower surface speed than in the case of those operating on the upper fabric. Obviously, while this surface speed relation may be obtained by the use of separate motors as shown, it will also be evident that it may be obtained through various different forms of driving mechanism other than the particular separate motor and chain connections shown. 80 85

With the ribbons thus wound on the roll 4 with their wet inked surfaces together and their dry cellulose ink retarding coated surfaces and dry inked surfaces spaced by paper, it will be evident that it is possible for the ink on the engaging surfaces on the ribbon to set in such manner as to produce a highly satisfactory ribbon, while the cellulose ink retarding coated surfaces (each having a top coat which is extremely thin, for very sharp, neat impressions of rich color and very clear, said top coat being of very dry, baked ink, which is perfectly clean and does not soil the hands) are protected by the paper. It will also be evident that they are very conveniently and compactly disposed in the form of a new 100 and convenient roll on which they remain while the wet, oily, highly penetrating, liquid ink with which the body portion of each ribbon is saturated and which covers one surface of each ribbon, sets and becomes less messy and oily and smudgy. After the ink has thus set for a period of suitable length, depending upon the kind of ink used, it will also be evident that the ribbons may be separated as they are drawn off from each roll and separately wound, cut, and otherwise prepared for distribution and use in the manner described in my previously mentioned patent, i. e. with the dry coated, ink retarding surface (upon which is an extremely thin layer or coating of very dry ink) of the ribbon placed 110 against the paper or other suitable, substantially non-absorbing material. 115

As a result of my improvement, it is made possible to produce a ribbon of the new type described in my patent, and of superior quality, 120 and to produce the same very economically with a minimum of attention on the part of the machine operator. It will also be observed that due to the treatment of the fabric, the same is so handled as to minimize waste or objectionable stickiness or smudging or soiling the coated, inked face while at the same time obtaining a satisfactory coating and impregnation of the fabric with the ink retarding coating material and inks. Attention is also directed to the large 130 production made possible with each unit constructed and operated in accordance with my improvement. It will also be evident that the fabric, initially in the wide, may be varied in width as desired, and that the width of the other mechanism may be similarly varied in such manner as to divide the two fabrics into as many ribbons as desired of any desired width. 135

In Figure 4 I have shown a modified construction which may be used if desired under certain conditions, as where it is desired to use a fabric previously coated with said ink retarding cellulose coating material or a fabric uncoated with same. In this construction it will be observed that the structure is the same as that previously described save that I have omitted the cellulose coating hopper and the oven associated therewith and shown therewith in Figure 1. In Figure 5 I have also illustrated a further modified construction also useful in connection with 140 145 150

fabric previously coated with ink retarding material or uncoated fabric, and wherein, as compared with the construction shown in Figure 4, I have also omitted the oven shown in the latter figure and acting as a drier for the ink supplied to the ribbon by the first inking means, the construction in other respects being the same as that shown in Figure 4.

The ribbons and ink transfer members herein described, when ready for use, therefore, have ink on one face which has been thoroughly dried by means of an oven as illustrated in the drawings herein mentioned, and the body portion of each ribbon is fully saturated and filled with oily, liquid, fast-flowing typewriter ribbon ink. It is plain, of course, that the latter ink when first put into the ribbons makes the fabric very wet and smeary and smudgy and messy and this oily ink has to set. The dry ink described herein is an extremely thin, surface layer of ink and is simply for use to write with until the ink in the fabric (or reservoir of ink located in said fabric) begins to work through the ink retarding surface coating which lies directly underneath the said dry ink and between the large body of ink contained in the highly absorbent fabric and said dry ink, and said dry ink is of such character as to give extremely neat writing or impressions of the utmost clearness and good color. This type of ink retarding ribbon is simply one of the kinds which may be produced more economically and more efficiently by my new methods and with the use of my new, improved apparatus and equipment. Other types of ink retarding ink transfer members may be advantageously and more economically produced by my new methods, as well as ink transfer members generally and of various types and kinds and I do not in any way limit myself to the ink retarding ink transfer members of my various patents.

While I have herein specifically described three forms of my invention, it will be understood that the embodiments described herein are used for illustrative purposes, and that the invention may be modified and embodied in other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:—

1. The steps in making ink transfer members which comprise producing a plurality of inked strips, more dry on one side than on the other, winding said strips together with their more wet surfaces in engagement and their more dry surfaces out of contact, and maintaining this relation while the ink sets.

2. The method of making ink transfer members which comprises feeding a plurality of wide sheets of inked fabric in superimposed relation through slitting machines, reversing the slit portions, inking the latter when reversed, again reversing one of the same, and bringing said last mentioned inked portions together.

3. The method of making ink transfer members which comprises feeding a plurality of wide sheets of inked fabric in superimposed relation through slitting machines, reversing the slit portions, inking the latter when reversed, again reversing one of the same, bringing said last mentioned inked portions together, and spooling said united portions with a filler between each layer.

4. The method of making ink transfer members which comprises inking one surface of a plurality of strips of fabric, baking each of the same, slitting each of the same, inking the other surface of

the same, and winding the slit portions together with said last mentioned surfaces in engagement.

5. The method of making ink transfer members which includes the steps of inking a face of a wide fabric which is less absorbent than the opposite face of said fabric, drying said inked fabric, slitting said fabric into ribbons, providing a non-raveling edge, inking the opposite face of each ribbon with a penetrating ink so as to impregnate the fibres of said fabric ribbons with ink without soiling the dry face of each ribbon and winding said ribbons in pairs with the dry faces separated by a spacing material to prevent soiling or smudging.

6. The method of making ink transfer members which includes inking a plurality of members on one surface only, winding said members with the wet or moist inked surfaces together and retaining them together until the ink sets.

7. The method of making ink transfer members from a wide fabric having one face more absorbent than the other face so as to effect a series of strips each having one, dry, inked face and one heavily inked face, which comprises: (a) inking said wide fabric on the less absorbent face (b) drying said inked fabric (c) slitting said fabric into strips of the desired width (d) and simultaneously fastening the edges of each strip against raveling (e) inking the opposite surfaces of said strips heavily (f) winding said ink transfer members in such manner as to bring the heavily inked, moist faces together and with another web or fabric or material of suitable kind protecting the dry, inked faces against smudging.

8. The method of making ink transfer members which consists and comprises (a) feeding in parallel relation a plurality of coated webs of fabric each carrying dry ink on the coated face, and (b) slitting the same (c) fastening the edges against raveling (d) reversing the slit pieces (e) inking the opposite surfaces of the slit pieces heavily (f) winding said slit pieces with the heavily inked faces in contact.

9. The method of making ink transfer members which includes coating one surface of a wide fabric with ink-retarding material, drying said coated surface, inking said coated surface with a heavy bodied ink, drying same, slitting the wide fabric into strips, fastening the edges of said strips against raveling, inking the other face of each strip with a penetrating ink, and winding the ink transfer members in pairs with the dry faces separated by a spacing material to prevent soiling and smudging.

10. The process as in claim 9 wherein the spacing material is fabric material.

11. The method of making ink transfer members which includes coating one surface of a wide fabric with ink retarding material, drying said coated surface, inking said coated surface with a heavy-bodied ink, drying same, slitting the wide fabric into strips, fastening the edges of said strips against raveling, inking the other face of each of said strips with a penetrating ink, and winding each strip in such a manner as to avoid smudging or soiling the coated surface of said strip.

12. The method of making ink transfer members according to claim 11 wherein the strips are so wound that the coated surface carrying the dried heavy-bodied ink does not contact with the opposite surface of each of said strips.

13. The method of making ink transfer members which includes applying to one face of an absorbent fabric a superficial coating of ink, dry-

ing and slitting the fabric, and impregnating the strips through the other face with a penetrating ink.

14. The method of making ink transfer members which includes providing an absorbent fabric having an ink retarding coating on one face thereof, applying to said face a superficial coating of ink, drying and slitting the fabric and impregnating the strips through the other face with a penetrating ink.

15. The method of making ink transfer members which includes inking one face of a wide fabric with a superficial coating of a heavy-bodied ink, drying and slitting the fabric, gumming the edges of each of the strips, reversing the faces of the strips and applying to the uninked faces a penetrating ink.

16. The method of making ink transfer members which includes providing an absorbent fabric having an ink retarding coating on one face, inking said face with a superficial coating of a heavy-bodied ink, drying and slitting the fabric, gumming the cut edges of the strips, reversing the faces of the strips and applying to the uninked faces a penetrating ink.

17. The method of making ink transfer members which includes providing strips of absorbent fabric having an ink retarding coating on one face thereof, applying a penetrating ink to the uncoated faces of said strips and winding the strips in such manner as to prevent smudging or soiling the faces which carry the ink retarding coating.

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