

July 4, 1944.

F. O. TRUMP

2,352,983

CONVEYING APPARATUS

Filed Jan. 30, 1942

2 Sheets-Sheet 1

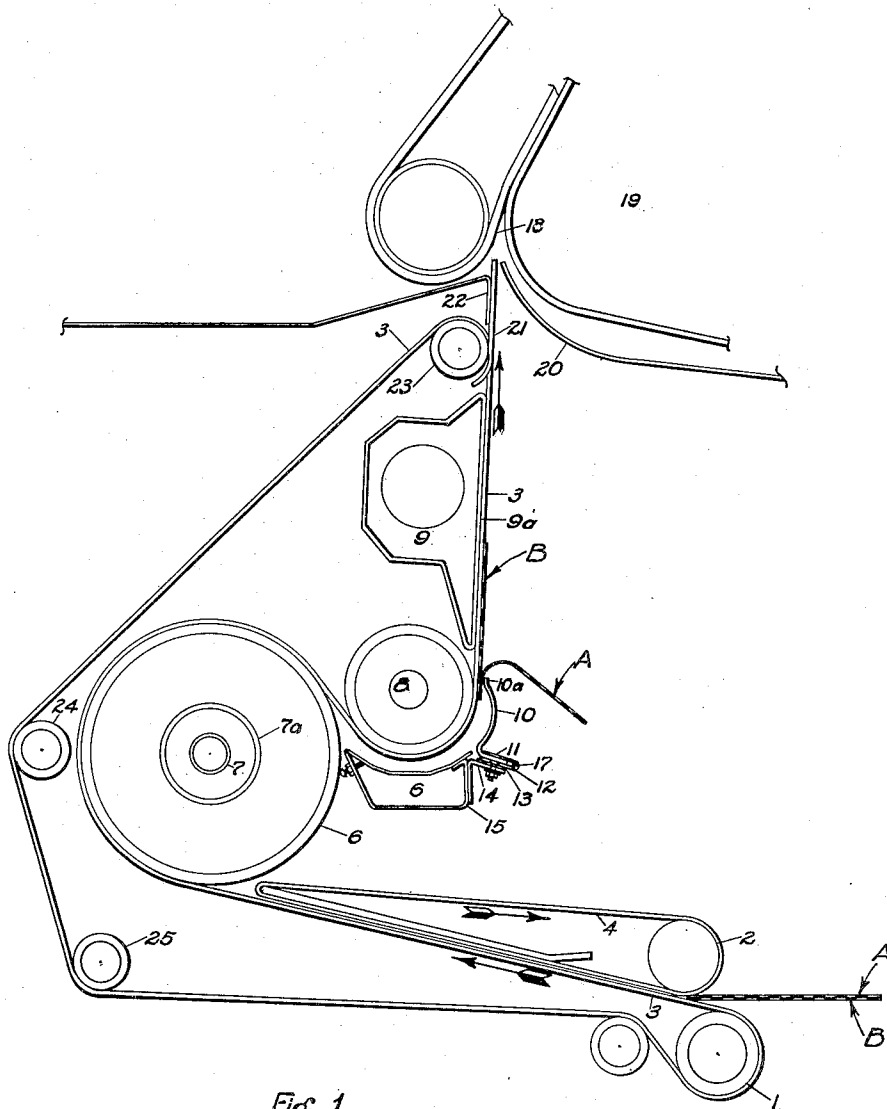


Fig. 1

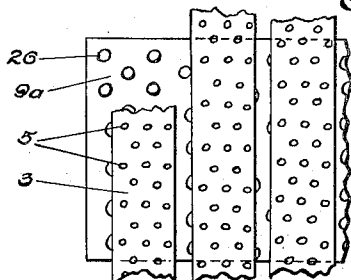


Fig. 3

FREDERICK O. TRUMP
INVENTOR

BY *Richard J. Johnson*
Charles E. Walker
ATTORNEYS

July 4, 1944.

F. O. TRUMP

2,352,983

CONVEYING APPARATUS

Filed Jan. 30, 1942

2 Sheets-Sheet 2

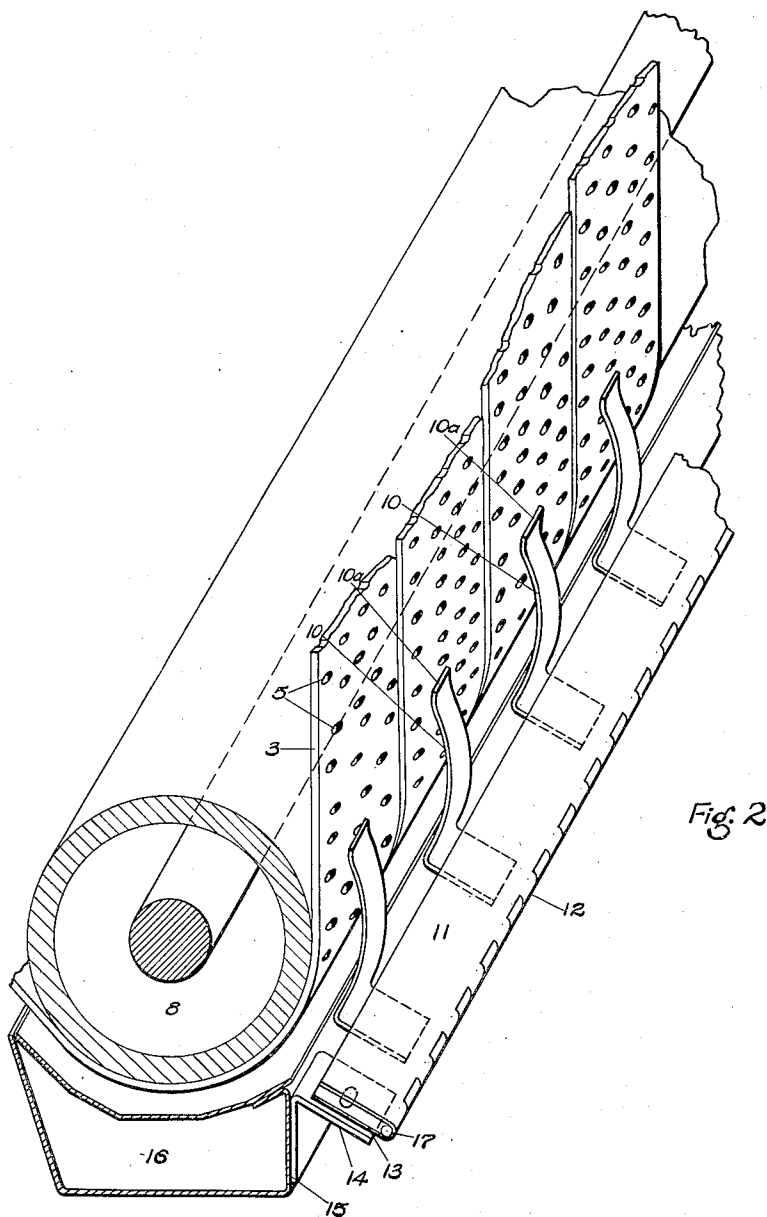


Fig. 2

FREDERICK O. TRUMP
INVENTOR

BY *Philip O. Hopkins*
Robert G. Miller
ATTORNEYS

UNITED STATES PATENT OFFICE

2,352,983

CONVEYING APPARATUS

Frederick O. Trump, Binghamton, N. Y., assignor
to General Aniline & Film Corporation, New
York, N. Y., a corporation of Delaware

Application January 30, 1942, Serial No. 428,907

3 Claims. (Cl. 271-64)

This invention relates to apparatus for transporting paper or film or the like work pieces from a lower to a higher point in connected parts of an apparatus wherein said work pieces are being treated. More particularly, the invention relates to an improved means for separating the original from the print and transporting the print in a vertical direction from the printing section to the developing section of an apparatus for printing and developing light-sensitive material of the diazotype dry process kind. Many devices are known for the development of light-sensitive materials using in one way or another a conveying belt to transport the print from the exposure area to the developer.

It has been found to be extremely difficult to separate the print from the original in such a way that the print may continue to be carried into the developing chamber while the original drops into a suitable receptacle. For instance, air blasts have been used but have been proven to be impractical since many times both the print and original are blown from the conveyor belt. Cylindrically shaped suction members have been tried but are also unsatisfactory as it is difficult to devise efficient means to prevent the print from continuing around the cylinder instead of being transported into the developer.

One of the objects of this invention, therefore, is to provide an improved means for separating said print from the original.

Another object is to prevent both the print and original from continuing into the developing chamber.

Another object is to prevent both the original and the print from being carried past the entrance to the developer.

Another object is to provide an efficient, economical and practical means for transferring the print from the exposure area to the developer without the necessity of a manual operation.

With these and other objects in mind, I have developed a combination for conveying the work piece, which it is desired to transport from one point of the process to another, in a vertical direction. The combination substantially consists of a suction tank having a substantially vertical perforated face plate through the perforations of which the suction exerts its effect and past which a perforated conveyor belt or belts are drawn and a hinged element designed to guide the work piece in a vertical direction into the effective area of the suction tank.

My invention will be more readily understood by reference to the accompanying drawings, the

following description of which, for the purposes of illustration, is confined to the preferred embodiment which comprises an adaptation of the combination to an apparatus consisting of a printer and developer for processing the light-sensitive materials mentioned above.

Figure 1 is an end view illustrating the path followed by the original and print and the position of pivoted guide fingers with respect to a flat vertical suction surface.

Figure 2 is a perspective view, partly in section, showing the combination of pivoted guide fingers and perforated conveyor belts.

Figure 3 is a face view of one end of the suction tank showing the perforated surface and position of the conveyor belts.

The original to be copied, designated as A, and the light-sensitive paper B enter the apparatus between guide rollers 1 and 2. They are picked up by driven endless belts 3 and 4 which are relatively close together to prevent wrinkling of the work pieces. Endless belts 3 have perforations 5 throughout the surfaces.

The work pieces are conveyed by perforated belts 3 around the periphery of curved glass 6 within which a luminescent tube 7 as the light source is located for exposing the light-sensitive paper. 7a is a quartz envelope surrounding the luminescent tube 7. The original A and print B travel in a downwardly direction around guide roller 8 and then move upwardly in a substantially vertical direction. Above this guide roller 8 and behind perforated belts 3 is suction tank 2. At the point where the conveying bands 3, original A and print B start to travel in a vertical direction after moving around guide roller 8, there is a series of pivoted fingers 10 which are rigidly attached to the under side of top plate member 11 of the hinge 12. The bottom plate member 13 of the hinge 12, in turn, is rigidly affixed to metal brace 14 extending from the rear side 15 of air duct 16 to which it is rigidly attached.

Fingers 10 are L-shaped metal pieces the upright portion of which is curved so that only the tips 10a come into contact with the work pieces. Hinge 12 pivots around pin 17 in order that guide fingers 10 may be adjusted, with relation to belts 3, to suit the thickness of the work pieces passing simultaneously between guide fingers 10 and conveyor belts 3. If guide fingers 10 are too close to the conveying belts 3 both the original A and the print B may be carried upwardly into the developing chamber. On the other hand, if they are too far away, both the original A and print B may curl outwardly into a receptacle for the original.

By pivoting around pin 17, guide fingers 10 may be adjusted with respect to their distance from the perforated belts 3 so as to insure sufficient space for the work pieces to pass through, yet being near enough to guide print B into the effective sphere 9a of suction tank 9. In this way guide fingers 10 can be adjusted for maximum efficiency.

Suction tank 9 has a flat outer surface 9a containing perforations 26 over which the perforated belts 3 pass. When original A and print B start to move in a vertical direction, after leaving guide roller 8, pivoted fingers 10 guide the work pieces in a vertical direction until one end of the print B has reached the effective area 9a of suction tank 9 and is held onto the belts by the suction acting therethrough. The original A is on the outer side of print B and, upon traveling upwardly past the tip 10a of guide fingers 10, tends to curl outwardly, dropping into any suitable receptacle provided therefor. The print B passes over the effective surface 9a of suction tank 9 and is carried upwardly by the belts 3 into contact with endless belt or belts 18 leading into the developing chamber 19. Metal pieces 21, attached to frame 22, are curved around guide roller 23 and serve to prevent print B from continuing along with belts 3 as they travel downwardly and rearwardly around guide rollers 24 and 25. The lower portion 20 of chamber 19 is parabolic in shape to guide print B into engagement with belt or belts 18 and to prevent it from curling forwardly away from conveyor belts 3.

It is believed that the invention and its numerous attendant advantages will be understood from the foregoing description. It is quite obvious that various changes can be made, in the arrangement of the various elements, the form, construction, and type thereof, without departing from the spirit or scope of the invention. The particular detailed description outlined above represents a preferred embodiment for the purpose of illustrating the invention, modifications or mechanical departures, which do not impair the efficiency of the machine and which fall within the scope of the invention, will, therefore, readily suggest themselves.

Having now particularly described my invention, what I claim as new is:

1. In a continuous treating apparatus for thin pliable work pieces in which two thin pliable work pieces are conveyed through a portion of the machine in superimposed relation to each other, a device for separating said two thin pliable work pieces as they emerge simultaneously and in superimposed relation to each other at a locus intermediate the ends of said treating apparatus, whereby one of said work pieces may be discarded and the other of said work pieces may be conveyed to another portion of said treating apparatus, which comprises in combination; an endless perforated belt for conveying said work piece which is to be retained in said apparatus, a roller over which said endless belt runs for changing the direction of travel of said belt, a suction tank having a vertical perforated surface over which said belt runs in an upwardly direction after it leaves said roller, a fixed curved

guide surface surrounding but spaced from said belt through the first part of its travel around said roller, and an adjustable guide device surrounding but spaced from said belt through the last portion of its travel around said roller, said adjustable guide device comprising a plurality of hinged fingers extending in the direction of travel of said belt, whereby the spacing of the ends of said fingers from said belt may be so adjusted at a locus near the locus where said belt leaves said roller, as to cause one of said work pieces to be conveyed by said belt upwardly past said suction tank and the other of said work pieces to curve outwardly from said belt and drop therefrom.

2. In a conveying apparatus in which two thin pliable work pieces are conveyed in superimposed relation to each other on a continuous perforated belt, a device for removing the outermost of said work pieces from said belt while causing the other of said work pieces to remain on said belt and be conveyed there along; said separating device comprising, in combination, a curved surface over which said belt runs for changing the direction of travel thereof, a suction box having a vertical perforated surface over which said belt runs after it leaves said curved surface, an adjustable guide device surrounding but spaced from said belt through at least the last part of its travel about said curved surface, said guide means comprising a plurality of hinged fingers extending in the direction of travel of said belt whereby the spacing of the ends of said fingers from said belt may be so adjusted at a locus near the locus where said belt leaves said roller, as to cause one of said work pieces to be conveyed by said belt upwardly past said suction tank and the other of said work pieces to curve outwardly from said belt and drop therefrom.

3. An apparatus for separating an original work piece and a print made therefrom on light-sensitive material, which original and print emerge simultaneously and in superimposed relation to each other from the printer section of a combined printing and developing machine, discarding the original and conveying the print to the developer section of said machine; which comprises, in combination, an endless perforated belt for conveying said light-sensitive material with said original work piece superimposed thereon, a roller over which said endless belt runs for changing the direction of travel thereof, a suction tank having a vertical perforated surface over which said belt runs in an upwardly direction after it leaves said roller, and an adjustable guide device surrounding but spaced from said belt through at least the last portion of its travel around said roll, said adjustable guide device comprising a plurality of hinged fingers extending in the direction of travel of said belt whereby the spacing of the ends of said fingers from said belt may be so adjusted at a locus near the locus where said belt leaves said roller as to cause said light-sensitive material to be conveyed by said belt upwardly past said suction tank and to cause said original work piece to curve outwardly from said belt and drop therefrom.

FREDERICK O. TRUMP.