May 29, 1945. L. M. BALLAMY ET AL 2,377,123

TRANSFER MEANS FOR FIBROUS MATERIAL

Filed May 11, 1942

Fig. 1.

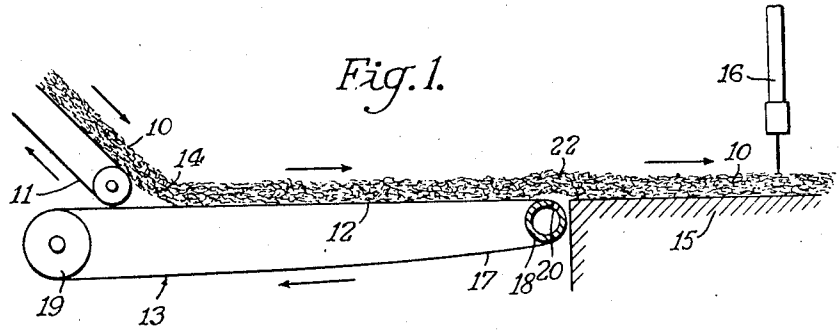


Fig. 2.

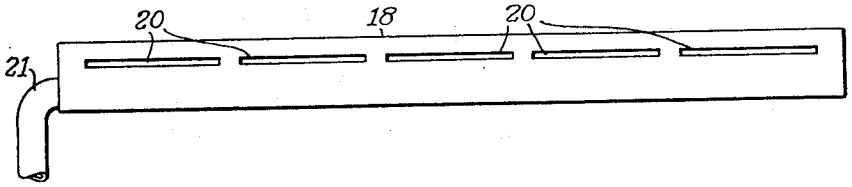
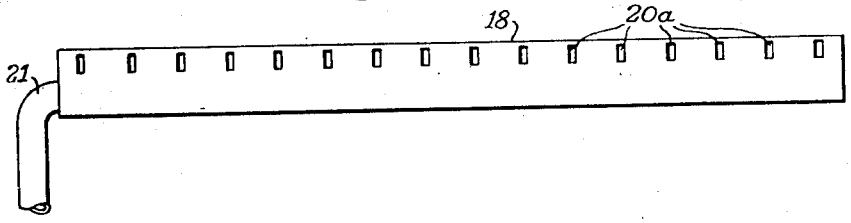


Fig. 3.



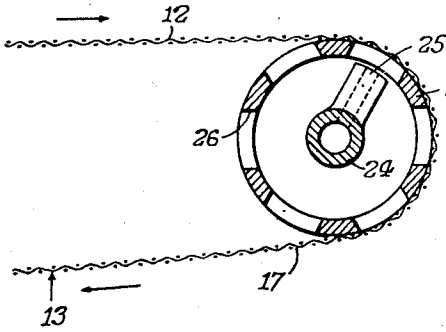


Fig. 4.

Inventors
Leslie M. Ballamy
Richard H. Sheepshanks
By J. Shipman
Atty.

Patented May 29, 1945 2,377,123

UNITED STATES PATENT OFFICE

2,377,123

TRANSFER MEANS FOR FIBROUS MATERIAL

Leslie Mark Ballamy, Caterham-on-Hills, and Richard Hasell Sheepshanks, Eyke, Woodbridge, England

Application May 11, 1942, Serial No. 442,573
In Great Britain July 11, 1941

8 Claims. (Cl. 198—20)

This invention relates to machines for dealing with loosely laid layers of fibrous material, such as kapok.

When loosely laid layers of fibrous material, such as kapok, are being handled in a machine, for instance in the manufacture of quilting, difficulty is sometimes experienced in transferring the weakly adherent layer of fibres from one conveyor to another, and it is the object of the present invention to provide an improved method and means for effecting such transference in a simple and efficient manner.

According to the present invention, a method is provided for transferring a layer of loosely laid fibres from one surface to another consisting in separating the layer from the said one surface by the introduction of compressed air or other gas.

Further according to the invention, a method of transferring a layer of loosely laid fibres from the surface of a travelling band or the like composed of pervious material, to another surface, consists in introducing compressed air or other gas to the opposite surface of the band or the like, whereby said gas passes through said band or the like and separates the layer of fibres therefrom.

Preferably the band or the like passes over a hollow member which is fed with compressed air or other gas and which has an opening or openings through which the gas issues, so as to impinge against the under surface of that part of the band or the like supporting the layer of fibres. The band or the like can be arranged to slide over a fixed hollow member having an upwardly directed aperture or series of apertures such as slots through which the compressed gas issues. Alternatively the band or the like may pass around a rotatable hollow cylindrical drum formed with perforations through which the compressed gas issues, the compressed gas conveniently flowing into the cylindrical drum through a fixed longitudinal duct and being directed through the perforations in the drum by means of one or more radial nozzles.

There is further provided for carrying out the above method a device comprising an endless band of material which is pervious to compresesd air, means for continuously moving said band, a hollow member over which said band moves, means for feeding compressed air to the interior of said member, and an upwardly directed aperture or series of apertures through which the compressed air issues so as to penetrate the band and lift the layer of fibres from the upper surface of said band.

The invention is illustrated by way of example in the accompanying diagrammatic drawing, in which:

Figure 1 is a sectional side elevation showing one arrangement for transferring a loosely laid layer of fibres to a machine such as a sewing machine;

Figure 2 is an elevation of one form of compressed air tube having longitudinal nozzles or apertures;

Figure 3 is a view similar to Figure 2 but showing nozzles or apertures of different shape; and

Figure 4 is a sectional elevation of another arrangement in which the band or the like passes around a rotatable roller.

In the arrangement shown in Figure 1 a loosely laid layer of fibrous material, such as kapok, indicated at 10, is delivered along an endless conveyor belt or band 11 and passes on to the upper run 12 of an endless conveyor band 13, the transfer at 14 being readily effected, as both of the bands 11 and 13 are being driven at the requisite speed by suitable means (not shown). At the end of the upper run 12, however, it is desired to transfer the fibrous layer 10 on to the stationary platform 15 of a sewing machine, one of the needlebars of which is indicated at 16.

In order that this transfer may be effected successfully without tearing or disarranging the layer 10 or permitting the fibres thereof to be carried along the return run 17 of the band 13, the latter is composed of flexible openwork material, such as wire gauze, textile fabric, or the like, which is pervious to compressed air, and is arranged to slide around the surface of a transversely disposed compressed air tube indicated at 18. The band 13 is, of course, driven from the opposite end by passing around a driven roller 19. The compressed air tube 18 is formed with a series of longitudinal slots 20 which are directed obliquely upwards and forwards, the arrangement of these slots being shown more clearly in Figure 2. The compressed air which is fed through an inlet pipe 21 thus escapes upwardly through the slots 20 and passes relatively freely through the interstices of the band 13. The escaping air lifts the fibrous layer 10 bodily away from the band 13 as the latter pases around the tube 18 and consequently the flow of air gently guides the layer 10 on to the upper surface of the platform 15, the layer "arching" slightly, as indicated at 22.

The slots or other escape apertures in the com-

pressed air tube 18 may, of course, be arranged in various ways and they may consist merely of circular perforations. Another form is, however, shown in Figure 3, and in this case the tube 18 has a number of arcuate nozzles 20a which have their longitudinal axes directed circumferentially. This produces a more diffused draught of air, which is found to be beneficial when the layer 10 is rather thin or exceptionally loose.

If desired, instead of having a fixed air tube 18 over which the band 13 slides, said band may engage with a freely rotatable roller by adopting the arrangement shown in Figure 4. This roller is indicated at 23 and is conveniently adapted to rotate freely upon a fixed tube 24, which latter serves also to conduct the compressed air to a number of obliquely directed radial nozzles, one of which is shown at 25. The roller 23 is formed around the whole of its curved surface with perforations 26, through which the compressed air from the nozzles 25 is free to pass when the perforations come into register with said nozzles 25. It will be seen that, despite the rotation of the roller 23 as the band 13 travels along, an upward draught of air is forced through the interstices of the band 13 and consequently lifts the layer 10 of fibrous material in a manner similar to the preceding example. If desired the roller 23 can be utilised for driving the band 13.

It will be realised that the invention can be employed wherever a layer of fibrous material, usually in a loosely laid form, is to be transferred from one surface to another, and although it is of particular utility where one of the surfaces is stationary, it may also be found to be desirable when both the surfaces are driven. The means used for introducing the compressed air may, of course, take various forms.

What we claim is:

1. An apparatus for transferring a layer of loosely laid fibres from one surface to another, including a travelling pervious band to support said fibres, a hollow rotating member forming a support for the band, and means for delivering air or like gas under pressure to the interior of the member, said member being formed with peripheral outlets directing such air or gas through the band and beneath the fiber layer during rotation of said member, said air delivering means including a pipe and nozzles carried by and in communication with said pipe for delivering the air through the peripheral outlets of the member.

2. A construction as defined in claim 1, wherein the peripheral outlets are elongated.

3. In a transferring means for use in transferring material from an endless pervious traveling band to a separate surface immediately beyond the band, said transfer means including a hollow rotating member forming a support for and rotating during band movement, said member being formed with a series of peripheral openings successively presented in operative position relative to the material on the band, a fixed tube on which the member is rotatably mounted and open to a source of compressed air or gas, and a nozzle open to the tube within the member and serving to deliver the compressed air or gas passing through the tube through the openings in the member as successively presented in operative position.

4. In a machine of the class described, an endless band composed of pervious material, a perforated hollow guide roller movably mounted and extending transverse said band, a separate surface adjacent the roller but external to the band, means for moving said band longitudinally so that its upper outer surface runs toward said separate surface carrying a layer of loosely laid fibres and then around the guide roller, means for feeding compressed air to the interior of the guide roller, means to compel and confine such air to an upward flow through the perforations in the roller as successively presented in an operative position, and passing through the endless band, acts upon the under-surface of the layer of fibres to lift the latter free of the endless band so that said layer may pass on to the said separate surface.

5. A machine as claimed in claim 4, wherein a pipe extends longitudinally within the guide roller for distributing compressed air along the length of the roller.

6. A machine as claimed in claim 4, wherein there is provided within the guide roller a longitudinally extending pipe fed at its end with compressed air, a plurality of nozzle apertures distributed along the length of the pipe being directed upwardly to cause the compressed air issuing therefrom to pass through the perforations at the upper part of the guide roller, and after passing through the endless band, impinge against the underneath of the layer of fibres.

7. In a transferring means for use in transferring material from an endless pervious flexible travelling band to a separate surface immediately beyond the band, said transfer means including a lateral tube forming a support upon and around which the band slides to reverse its direction of movement in readiness for commencing its return run, means for delivering air or like gas under pressure to the interior of the tube, and directing means formed in the wall of the tube for causing the gas to flow upwards through the band as said band passes around the tube, the gas separating the fibre layer from the band and lifting said layer on to the said separate surface.

8. In a transferring means for use in transferring material from an endless pervious flexible travelling band to a separate surface immediately beyond the band, said transfer means including a lateral tube forming a support upon and around which the band slides to reverse its direction of movement in readiness for commencing its return run, means for delivering air or like gas under pressure to the interior of the tube, upwardly directed delivery openings formed in the wall of the tube for causing the gas to flow upwards through the band as said band passes around the tube, the gas separating the fibre layer from the band and lifting said layer on to the said separate surface.

LESLIE MARK BALLAMY.
RICHARD HASELL SHEEPSHANKS.