T. BEMIS, Sr.

SANITARY CONVEYER.

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1,255,977.

Patented Feb. 12, 1918.

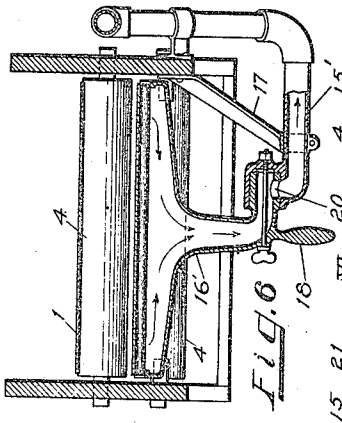


Fig. 6

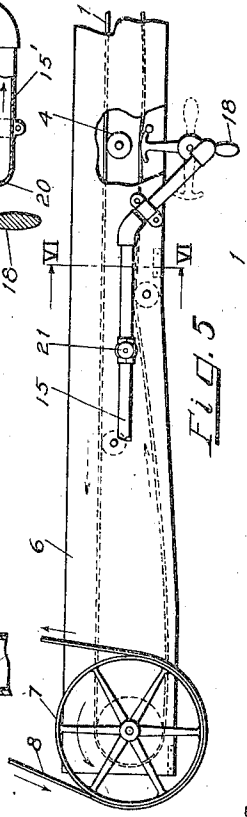


Fig. 5

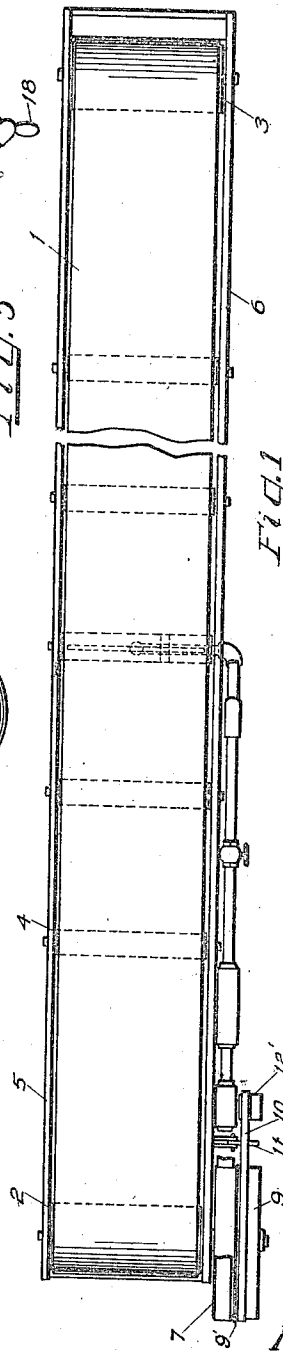


Fig. 1

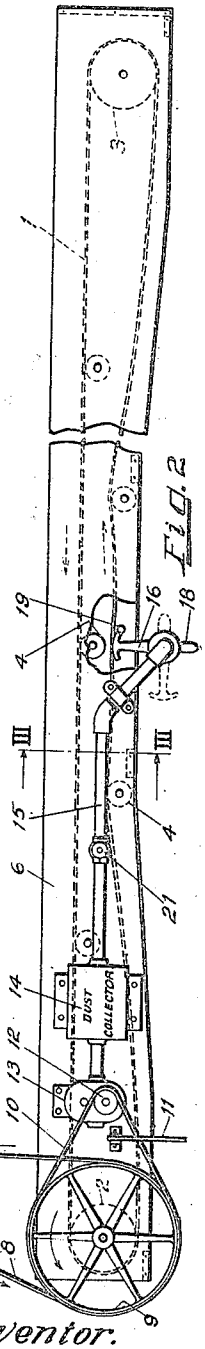


Fig. 2

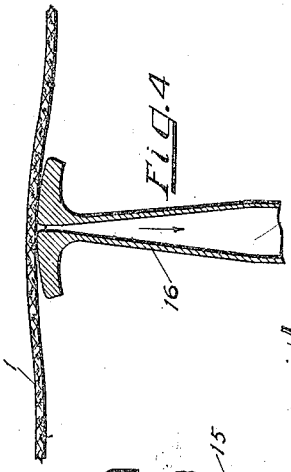


Fig. 4

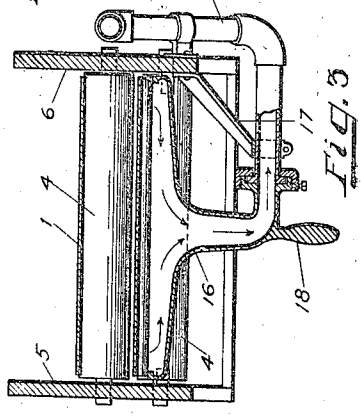


Fig. 3

Witnesses.

Charles O. Lauvin.

Harry M. Goddon.

Inventor.

Thomas Bemis Sr.

By Chas. F. Gleason

his Attorney

UNITED STATES PATENT OFFICE.

THOMAS BEMIS, SR., OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE LAMSON COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF NEW JERSEY.

SANITARY CONVEYER.

1,255,977. Specification of Letters Patent. Patented Feb. 12, 1918.

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To all whom it may concern:

Be it known that I, THOMAS BEMIS, Sr., a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Sanitary Conveyers, of which the following is a specification.

This invention relates to an improvement in belt conveyers and the like and to a method of sanitation for devices of this description.

As is well known in the belt conveyer art, devices of this character are apt to become uncleanly by reason of the accumulation of dirt and dust of various descriptions (depending upon the usage to which the conveyer is put) in the pores of the fabric or upon the surface of the belt.

This tendency to collect dirt is aggravated by the tendency of the belt to become electrified when in operation and to thereby attract small particles of dust. To the best of my knowledge the only attempts to maintain a device of this character in sanitary condition, which have heretofore been made, have involved the use of manual labor, which of course is more or less expensive and further is objectionable since the scouring of the belt by hand must either be done at some time when the conveyer is not in operation or else such procedure is apt to interfere with the normal use of the device.

The nature of the materials usually employed for belts particularly adapts them to cleansing by an air current due to a departure from atmospheric pressure at points adjacent the parts being cleaned; since if the belt be of woven material such as canvas, it is porous, and if a suction nozzle be presented to a surface thereof, atmospheric pressure will drive the accumulated dust or dirt out of these pores into the nozzle; whereas, if the belt be of leather, and consequently normally impervious to the air, the collection of dirt thereupon will be superficial in character and the suction device will, therefore, readily remove it from the carrying surface.

In the accompanying drawing which forms a part hereof and in which like reference characters designate like parts throughout the respective views, I have exemplified preferred constructions of apparatus embodying a conveyer belt and means for maintaining the same in sanitary condition, but as I am aware of various changes and modifications which may be made in these constructions, without departing from the spirit of my invention, I desire to be limited only by the scope of the claims appended hereto.

Referring to the drawing:

Figure 1 is a plan view of a combined belt conveyer and cleansing apparatus therefor.

Fig. 2 is a side elevation of the apparatus shown in Fig. 1.

Fig. 3 is a section taken on line III—III of Fig. 2.

Fig. 4 is a vertical median section taken through the cleaning nozzle.

Fig. 5 is a fragmentary side elevation of a conveyer, provided with a modified form of sanitation device; and

Fig. 6 is a section taken on line VI—VI of Fig. 5.

In the construction shown, the belt 1 may be of canvas, for example, or other suitable material, although it is to be understood that my invention is peculiarly well adapted to porous fabric belts. This belt may be mounted upon pulleys 2 and 3 and rollers 4 may be disposed at convenient intervals along the length thereof to support the same in a known manner. These pulleys and rollers may be mounted between side-boards 5 and 6; and the pulley 2 is, in the present instance, driven by a pulley 7 and belt 8, so that the belt 1 may be advanced continuously in the direction of the arrows indicated adjacent thereto, for the conveyance of parcels and various other articles.

In the form of device shown in Figs. 1 and 2, fast and loose pulleys 9′—9 may be conveniently mounted upon the extremity of the shaft which carries the pulleys 2 and 7, and a narrow belt 10, provided with the usual shifting device 11, transmits power from the fast pulley 9′ to the corresponding pulley 12′ upon the shaft of a suitable blower or pump 13, which may be secured, if desired, directly to the running board 6.

The in-take side of the blower is connected to a dust collector 14 of any suitable construction and the latter in turn is connected by a pipe 15 with a vacuum nozzle 16, preferably pivotally mounted upon a suitable

bracket 17 carried from the underside of the conveyer, so that the mouth of the nozzle may lightly wipe against the underside of the belt when the nozzle has been turned up into engagement therewith.

The nozzle may have an operating handle 18 and preferably has the mouth thereof arcuately formed so as to permit belt lacings or the like to ride easily thereover; said mouth presenting an extended wearing surface to the belt, as best shown in Fig. 4.

Ordinarily the nozzle will be turned down into its dotted line position shown in Fig. 2, so that the mouth thereof is out of engagement with the belt, but when it is desired to clean the latter, said nozzle is rotated clockwise as viewed in Fig. 2, until it engages the stop 19, and since the belt is traveling in a direction which tends to maintain this nozzle in engagement with its stop no further attention need be paid to the device after it has been started into operation until the belt has been sufficiently cleaned; whereupon the nozzle may be rotated counter-clockwise to its normal position.

This nozzle should preferably engage the belt at a point intermediate a pair of rollers 4 so that the belt may have a slight tendency to sag down into engagement therewith, and in practice it has been found that a few turns of the conveyer in the morning, suffice to free the belt from the dust and dirt collected thereupon or therein during the previous day's operation.

In the form of device shown in Figs. 1 and 2, after the nozzle has been moved into operative relationship with respect to the belt, the belt shifter 11 is thrown so as to start the blower and in order to save power when the nozzle is not in use the blower should again be rendered inoperative.

The mechanism just described will be found very convenient for single belts since the power for operating the sanitation device is derived substantially directly from the same belt or other drive which is used for the conveyer.

It frequently happens, however, that in a store or factory a plurality of conveyers of the type in question may be more or less adjacently disposed, in which case the partial vacuum for operating the one or more sanitation devices employed may be conveniently generated at a single point; a pipe 15 leading therefrom to the nozzle which cleans any given conveyer.

Where a separate nozzle is employed for each conveyer, the particular nozzle construction shown adapts itself to the provision in connection therewith of a rotary valve 20, best shown in Fig. 6. Herein the nozzle, designated 16′, may be substantially like that previously described except that instead of the rotary mouth thereof opening at all times into the pipe 15, said mouth is ported laterally to constitute the said valve 20 and hence when the nozzle is turned down through 90 degrees, this port therein and the corresponding end of the channel or passageway in the pipe 15′ are out of registration. Hence the mere act of turning the nozzle out of engagement with the belt suffices to also cut off the flow of air through this nozzle.

The details of construction of the swiveling connections between the nozzle 16 and its pipe 15 and the nozzle 16′ and its connection 15′ are plainly indicated in the drawing and hence need not be herein more particularly described; and it will be understood of course that suitable means for regulating the flow of air through the pipes 15 or 15′ may be provided, such, for example, as a valve 21.

It is believed that the method of operating a belt conveyer to maintain the belt thereof substantially free from dust and dirt, which is embodied in the above disclosure, is quite broadly new; and I particularly desire to call attention to the fact that in so operating a conveyer of the type in question the disposition of the suction nozzle in proximity to the underside of the belt is to be preferred, since, for one thing, as the particles of dirt are loosened from the belt, gravity tends to aid their removal, the air current of course co-acting with gravity to this end. Furthermore, since the belt is preferably driven continuously in one direction during the cleansing operation, each time that a portion thereof passes around a pulley, the material of the belt at such portion is flexed alternately first in one direction and then in the other, and this action tends to loosen the dust and dirt upon the belt. Of course, were it not for the fact that such dirt is then removed by the air current entering the suction nozzle, it would ultimately either be worked back into the belt or would be thrown off into the surrounding air.

Again, owing to the fact that the belt is being driven continuously during the cleansing operation, the successive portions thereof are drawn repeatedly across the nozzle, being as aforesaid flexed between times; and hence in a number of particulars the above cleansing operation differs from other cleansing operations in which a suction nozzle is employed.

Finally, I desire to direct attention to the advantageous disposition of the pivotal axis of the nozzle, extending, as it does, transversely of the belt, which permits of a nozzle having a relatively wide mouth, which extends more or less transversely of the belt, being turned down away from the latter whenever desired without disturbing the support for such nozzle.

Having thus described my invention what I claim is:—

1. The combination of a porous belt for carrying articles, with two pulleys upon which said belt is mounted, means to drive one of said pulleys to thereby drive said belt and the other pulley and to also cause successive portions of the belt to flex reversely and in alternate directions as they pass around said pulleys, to loosen the dirt which may have collected in the pores of said belt, means to cause currents of air to pass into said pores upon one side of said belt and out of said pores together with the loosened dirt at the other side of said belt, after said portions have been thus reversely flexed, and means to drive the means last aforesaid from one of said pulleys at a speed proportioned to that of the belt.

2. A belt conveyer, the belt of which is subject to the collection of dust and dirt thereupon, suction means for removing said dust and dirt, said means including a suction nozzle, means to create a partial vacuum in said nozzle, and means to pivotally support said nozzle so that it may be swung away from and substantially clear of said belt to obviate unnecessary wear thereof when not in use, the pivotal axis of the nozzle extending transversely to the direction of movement of the belt, and means to prevent inadvertent rotation of said nozzle by said belt when the nozzle is in engagement with the same.

3. A belt conveyer, the belt of which is subject to the collection of dust and dirt thereupon, suction means for removing said dust and dirt, said means including a suction nozzle, means to create a partial vacuum in said nozzle and means to mount said nozzle so that it may be moved into contact with or away from and substantially clear of said belt to obviate unnecessary wear thereof when not in use, and means to prevent inadvertent movement of said nozzle by said belt when the nozzle is in engagement with the same.

In testimony whereof I have affixed my signature, in the presence of two witnesses.

THOMAS BEMIS, Sr.

Witnesses:
W. H. Palmer,
F. P. Irish.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."