June 27, 1933. F. N. HAND 1,915,733

BEESWAX SEPARATOR

Filed April 25, 1928 2 Sheets-Sheet 1

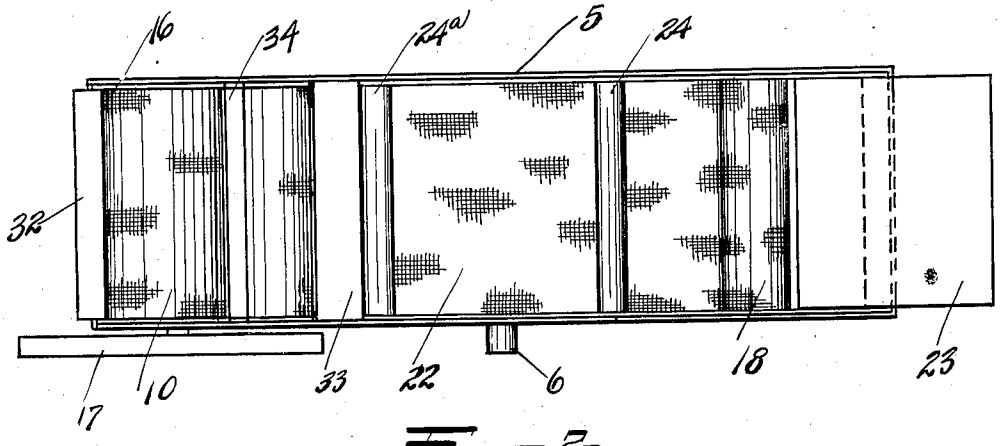

Fig. 2.

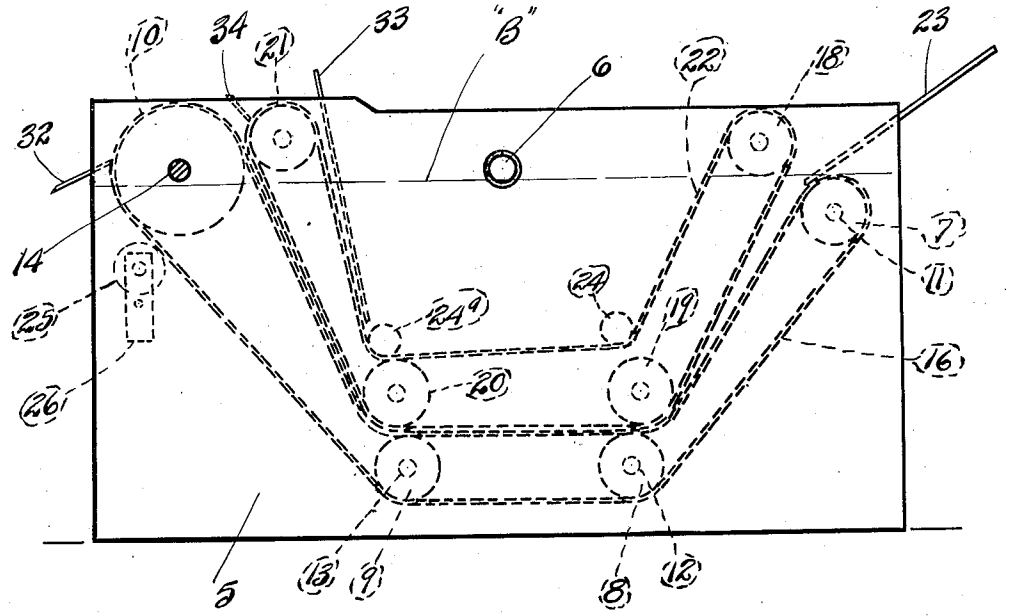

Fig. 1.

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BEESWAX SEPARATOR.

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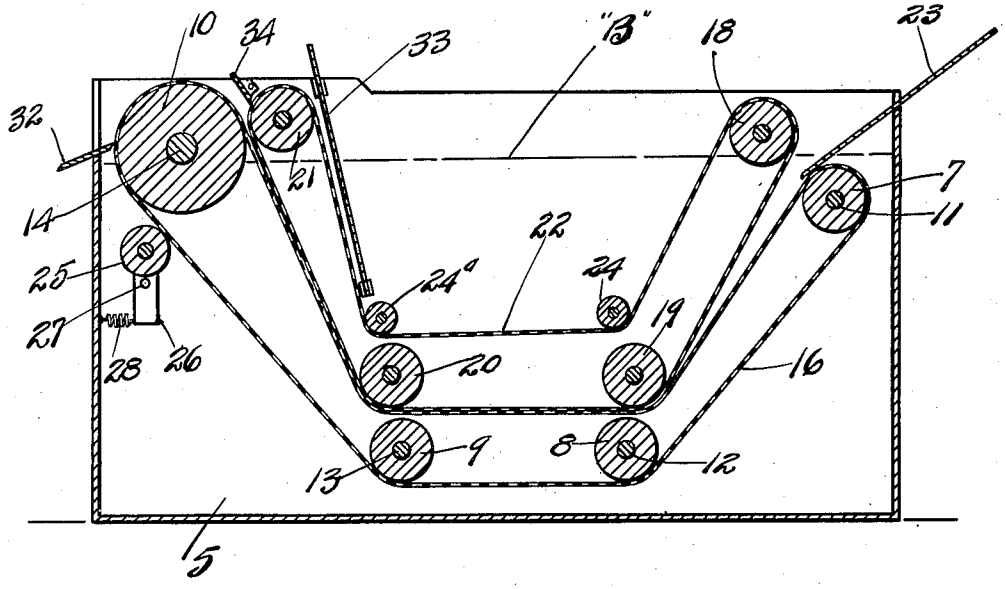

Fig. 3.

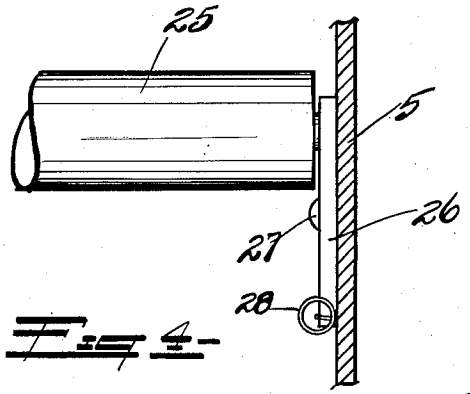

Fig. 4.

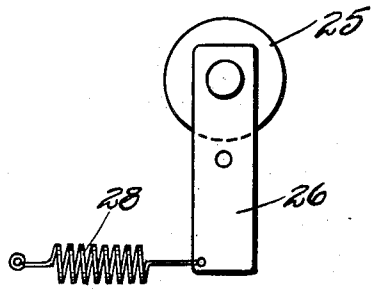

Fig. 5.

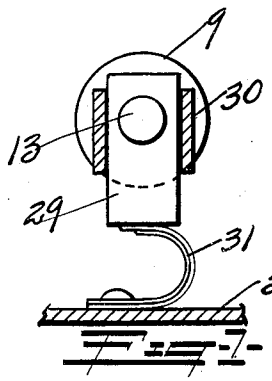

Fig. 7.

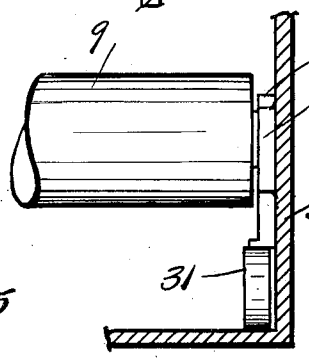

Fig. 6.

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Patented June 27, 1933 1,915,733

UNITED STATES PATENT OFFICE

FREDRICK NELSON HAND, OF SANFORD, MICHIGAN

BEESWAX SEPARATOR

Application filed April 25, 1928. Serial No. 272,676.

This invention relates to separators, and particularly to a bees refuse separator for separating the wax from the comb.

The prime object of the invention is to design a simple and inexpensive separator which will efficiently and readily separate the refuse from the comb, and which can be of a size so that it will be a practical and wise investment for individuals having a limited amount of beeswax to run.

Another object is to provide a simple and substantial separator, which is continuous in operation, which can be readily cleaned, and which is automatically adjustable.

A further object is to design a separator which can be either hand or power driven, and provide means for scraping the refuse from the belts as the machine operates.

With the above and other objects in view, the present invention consists in the combination and arrangement of parts, hereinafter more fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportion, and minor details of construction, without departing from the spirit, or sacrificing any of the advantages of the invention.

In the drawings.

Fig. 1 is a side view of my beeswax separator.

Fig. 2 is a top plan view thereof.

Fig. 3 is a longitudinal sectional view through the machine.

Fig. 4 is an enlarged fragmentary sectional view showing the mounting of the tensioning roller.

Fig. 5 is an end view thereof.

Fig. 6 is an enlarged fragmentary sectional view showing the mounting of the idler rollers.

Fig. 7 is an end view thereof.

Referring now particularly to the drawings, the numeral 5 indicates a water tight receptacle which can be formed of any suitable material, this is preferably rectangular in shape and is provided with an overflow pipe 6 located at a point intermediate the height of the receptacle, and for a purpose to be presently described.

Transversely disposed rollers 7, 8, 9, and 10 respectively, are positioned in the receptacle in spaced apart relation, said roller being mounted on shafts 11, 12, 13, and 14, the ends being shouldered and are journaled in bearings 15 secured to the side walls thereof. An endless belt 16 is trained over these rollers to form a conveyor, said belt being in the nature of a woven screen, having a plurality of openings therein, and I wish to direct particular attention to the fact that the roller 10 is of larger diameter than the others, and that the shaft 14 projects through the side walls of the receptacle, so that a drive pulley 17 can be secured on the end thereof, either for hand manipulation, or for connecting to any suitable source of power.

Similar rollers 18, 19, 20 and 21 are located above the first mentioned rollers which form the conveyor, and an endless belt 22 is trained thereover, this belt being of the same material, the rollers 19 and 20 however being so spaced with relation to the rollers 8 and 9, that they act as guides for the belt as it travels over the said rollers. The roller 7 is spaced from the roller 18 a distance sufficient to permit the comb (not shown) to be readily fed between the belts 16 and 22 and a detachable plate 23 is secured to the end of the receptacle in any approved manner, and serves as a table from which the comb is fed into the machine.

Idler rollers 24 and 24ª are provided above the rollers 19 and 20, and serve to tension the endless belt, and a similar idler roller 25 is provided in the front end of the receptacle for tensioning the belt 16, said roller being mounted in a bearing 26, which is pivotally secured to the receptacle side wall by the member 27, a coiled spring 28 being secured to the lower end as shown, and the opposite end anchored to the receptacle, all as shown in Figs. 4 and 5 of the drawings, the rollers 24 and 24ª being mounted in a similar manner. The rollers 7, 8, 11, 20 and 21 can be mounted in a stationary bearing, the roller 9 being mounted in a bearing 29 which is slidably mounted between

lugs 30 cast integral with the frame, a leaf spring 31 being secured to the bottom of the receptacle, the upper free end engaging the end of the bearing as clearly shown in Figs. 7 and 8 of the drawings, so that there is a tendency to force the roller 9 upwardly at all times, the roller 19 being mounted in an identically similar manner excepting that the members are reversed so that a tension is provided at all times to force the wax from the refuse.

A scraper member 32 is adjustably secured to the end of the receptacle as shown, the inner edge serving to scrape the refuse from the conveyor belt, the end of the receptacle being cut to accommodate the said scraper. The detachable feed plate 23 which is provided on the opposite end of the separator can be heated if desired and the heated beeswax is then fed between the traveling belts 16 and 22 and is thence carried into the separator.

A substantially vertically disposed plate 33 serves to exclude the wax, (which rises to the surface) from the front end of the separator, so that it cannot mix with the crushed refuse which is carried up by the conveyors, a scraper 34 being secured to the separator side walls and serves to scrape the refuse from the conveyor 22 and prevent it being carried around and through the separator again.

In practice the receptacle is filled with water up to the water line "B" and a suitable heating apparatus, (not shown), is provided for heating purposes, after the water has been heated to a predetermined temperature, power is applied for driving the conveyor, and the comb is fed between the belts, the hot water melts the wax, and the comb is crushed between said belts, breaking up any lumps or particles of wax that may adhere to the refuse, so that they readily dissolve, the wax rises to the surface and overflows through the pipe 6 into another receptacle, (not shown), and which is provided to receive it, the refuse is carried up by the conveyor, and is scraped off by the scraper as above described.

From the foregoing description it will be obvious that I have perfected a very simple, efficient, economical and novel separation for separating refuse from comb or for any other purposes for which the device is adaptable.

What I claim is:—

1. A beeswax separator comprising a receptacle adapted to contain a liquid and having an overflow pipe, submerged endless screen belt conveyors mounted therein in superimposed relation, the belt of the upper conveyor being forced against the face of the belt of the lower conveyor, the upper ends of said conveyors being spaced apart to permit the material to be received therebetween, a scraper engaging the lower conveyor, and means for driving said conveyors.

2. A beeswax separator comprising a receptacle adapted to contain a liquid, submerged endless perforated belts mounted therein in superimposed relation, means for forcing the belts against each other to crush the material being worked, a division plate interposed in said receptacle for excluding wax from the discharge end of the machine, and scrapers engaging said belts for removing the refuse as the machine is operating.

3. A beeswax separator comprising a receptacle adapted to contain a liquid and having an overflow pipe, submerged endless screen belt conveyors mounted therein in superimposed relation, and means for forcing one conveyor against the face of the other, the upper ends of said conveyors being spaced apart to permit the material to be received therebetween, scrapers engaging said conveyors, a division plate mounted in said receptacle for keeping the wax separated from the refuse, and means for driving said conveyor.

In testimony whereof I hereunto affix my signature.

FREDRICK N. HAND.