

(No Model.)

2 Sheets—Sheet 1.

F. PRINZ.  
DUST COLLECTOR.

No. 560,108.

Patented May 12, 1896.

Fig. 1.

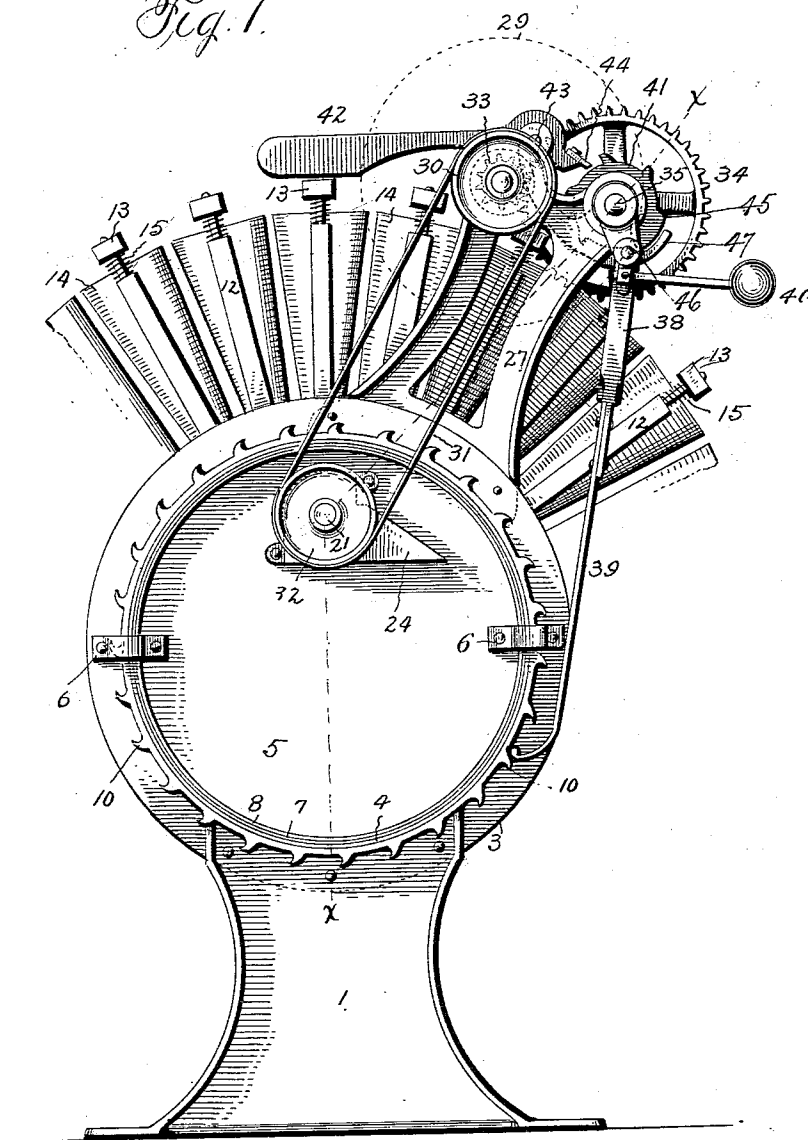
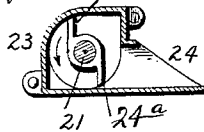


Fig. 8.



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# UNITED STATES PATENT OFFICE.

FAUSTIN PRINZ, OF MILWAUKEE, WISCONSIN.

## DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 560,108, dated May 12, 1896.

Application filed December 27, 1895. Serial No. 573,497. (No model.)

*To all whom it may concern:*

Be it known that I, FAUSTIN PRINZ, a subject of the Emperor of Germany, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Dust-Collectors; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to dust-collectors; and it has for its object to provide improved means for rotating the drum, to which are attached dust-collecting tubes.

It has further for its object to provide improved means for periodically actuating the knockers designed to dislodge the dust that may collect on the tubes.

It has further for its object to provide an improved construction of chamber located inside the drum and designed to receive the dust dislodged from the dust-collecting tubes; and it has further for its object to generally improve the dust-collector in particulars hereinafter made clearly to appear.

To the accomplishment of the foregoing and such other objects as may hereinafter appear, the invention consists in the construction and in the arrangement of the parts, as will be hereinafter particularly described, and then sought to be specifically defined by the claims, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is an end elevation of the machine with some of the dust-collecting tubes omitted. Fig. 2 is a vertical longitudinal section with parts omitted. Fig. 3 is a detail view, in vertical section, showing the manner of making the head of the drum air-tight. Figs. 4, 5, and 6 are detail views, on an enlarged scale and in section, showing manner of securing the tubes to the drum. Fig. 7 is a perspective of a portion of the drum, showing the manner of forming the openings for the insertion of the ring ends of the collecting-tubes, the dotted lines on Figs. 4 and 7 showing the position of the rings in inserting and

withdrawing the same; and Fig. 8 is a detail view, in vertical section, through discharge-cap.

In the drawings, the numeral 1 designates the standards, to the upper ends of which are secured the rings 2, which are formed with the flanges 3, through which and the upper ends of the standards bolts may pass to secure the rings to the standards. Within the rings 2 fit the rims 4 so as to turn therein, and which constitute the ends of the drum.

The numeral 5 designates the heads of the drum, which fit inside the rims 4 and are held stationary by the brackets 6, which are bolted at one end to the heads and at the opposite ends to the rings 2, so as to hold the heads in place. An air-tight joint is made between the inner face of the rims 4 and the heads 5 by means of a suitable packing 7, secured at one end to a wooden strip 8 attached to the head, and at the other end to a strip 9 lying inside of the rim 4, as illustrated. The outer periphery of the rims 4 are provided or formed with teeth 10 for a pawl to engage with, as hereinafter described, so as to rotate the drum. The inner ends of the rims 4 are formed with outwardly-extending flanges 11, to which are bolted the inner ends of arms 12, the upper ends of which sustain longitudinal bars 13, to which are connected the closed or solid heads of the outer ends of the dust-collecting tubes 14, the ends of said longitudinal bars 13 receiving the reduced upper ends of the arms 12 and resting upon springs 15 coiled around said ends so as to permit inward movement of the bars 13 when depressed by the knockers hereinafter described.

The inner ends of the collecting-tubes 14, which are made of suitable porous fibrous material, fit over the openings 16, formed in the periphery of the drum 17, which may be made up of close-fitting staves, or otherwise, whose ends fit in recesses 18, formed in the rims 4. The openings 16 in the drum are each formed at diametrically opposite points with notches 19, thus making the openings elongated, so that the rings 19<sup>a</sup>, which are attached to the lower ends of the tubes, may be inserted endwise through said notches from the outside of the drum, so as to bring the rings on the inside of the drum, when they will turn so as to lie with their broad sides against the

inner face of the drum around the openings and thus be prevented from withdrawal. When it is desired to take out any one tube, the ring will be turned edgewise, so that it  
 5 will pass through said notches and let the ring pass to the outside. This very greatly facilitates the connection of the inner ends of the tubes to the drum and admits of any one or more of the tubes to be disconnected  
 10 therefrom without dismembering other parts of the dust-collector.

Within the upper portion of the drum 17 is placed the cut-off chamber 20, which is supported at its ends from the inside faces of the  
 15 heads of the drum. This chamber is entirely shut off from the interior of the drum, but communicates with each series of the dust-collecting tubes as they are brought in succession over the chamber in the rotation of  
 20 the drum, and in which chamber the dust that has collected on the inside of the tubes is deposited as it is dislodged from the tubes by the blows of the knockers when the tubes are over the chamber. A conveyer-shaft 21 passes  
 25 through the cut-off chamber and is provided with blades 22, which may be of the form for which I obtained United States Patent No. 523,237, or other form, and arranged so that the dust collected in the chamber will be fed  
 30 from one end to the other and discharged through one of the caps 23, the discharge-cap being formed with a discharge-spout 24, which will have its top open and inclined, so that the dust will not clog or choke up the spout  
 35 and yet will at the same time stand in the spout, so as to close the same and thus prevent air being drawn through the spout into the cut-off chamber. The conveyer-shaft 21 will be provided directly opposite the spout 24 with  
 40 the flights 24<sup>a</sup>, so as to force the material from the cap into its discharge-spout. The dust-laden air is driven into the end of the drum by a fan 25 and it passes through the openings in the drum into the dust-collecting tubes  
 45 and out through the pores of the tubes, and as the tubes are brought over the cut-off chamber the dust is dislodged from the inside of the tubes and falls into the chamber, from whence it is carried off, as stated. The cut-off chamber will communicate through an air-  
 50 pipe 26 with the inlet to the fan, so as to create a back draft through the tubes over the cut-off chamber. This pipe 26 extends into the cap 24, which communicates with the cut-off chamber, so that air may enter the same from  
 55 the cut-off chamber.

The numeral 27 designates the brackets extending up from opposite ends of the machine and secured by bolts to the flanges 3 of the  
 60 rings 2. These brackets support at their upper ends the drive-shaft 28, which has the band or drive-pulley 29. The shaft also carries a pulley 30, from which power is transmitted through a band 31 to a pulley 32 on  
 65 the end of the conveyer-shaft 31. The shaft 28 also has secured to one end of it a pinion 33, which meshes with a gear-wheel 34,

secured to a shaft 35, journaled in the brackets 27. The gear-wheel 34 has a crank-pin 36 secured to it and also carries at the opposite  
 70 ends a crank-arm 37. To the crank-pin 36 and to the pin of the crank 37 are connected the arms 38, to which are secured the metal straps or bars 39, whose lower ends are turned  
 75 inwardly, so as to engage the teeth on the periphery of the rims 4, the arms 38 and straps 39 constituting pawls, which, in the rotation of the cranks attached to the shaft 35, are caused to engage the teeth on the rims 4, so  
 80 as to rotate the drum 17. For the purpose of holding the pawls in position to engage the teeth of the drum I prefer to attach to them the counterweights 40. The shaft 35 also carries cams 41, which are located opposite to  
 85 the heels of the knockers 42, which are mounted loosely on a shaft 43, that is supported by the brackets 27 preferably just above the main drive-shaft 28. The heels of these  
 90 knockers have metallic plates 44 secured thereto, so as to afford hard bearing-surfaces for the teeth on the cams 41 to strike against in the operation of lifting the knockers. As  
 95 each tooth of the cams strikes these plates 44 the knockers are lifted, and as soon as the teeth leave the plates the knockers drop and impart a blow to the bar 13, which supports the tubes immediately over the cut-off chamber, and thus cause the collecting-tubes to  
 100 partially collapse and then distend under the influence of the springs 15, so as to jar the dust from the inside surface of the tubes. The surface of the cams from the point 45 to 46 forms a rest designed to bear against the heel-plate of the knockers, so as to keep the same  
 105 depressed and the knockers raised while the drum is being rotated, thus keeping the knockers out of contact with the longitudinal bars 13 during that period. The parts are so arranged and proportioned that the knockers  
 110 will impart their blows while the drum and connecting-tubes carried by it are at a state of rest, and so that the knockers will be held in an elevated position while the drum is rotated. The numeral 47 designates a drip-cup,  
 115 one of which is placed under each of the cams 41, so as to catch any oil that may drop from the cams and thus prevent it from falling onto the cloth tubes. These drip-cups are secured at one end to the shaft 43 and near the  
 120 other end by an upward extension to the shaft 35, as indicated in Figs. 1 and 2 of the drawings.

It is found that under some conditions there is considerable wear on the cloth tubes where they are provided with the metal rings and enter the drum. In order to increase the  
 125 durability of the cloth at such point I either apply a shield 48 of heavy cloth or other material around the ring and adjacent cloth of the tubes, as shown in Fig. 6, or else a thin metal strip or shield 49, as shown in Fig. 5,  
 130 which shields may be secured by any suitable fastening—light wire staples, or other means, as found convenient and suitable—or made to hold by frictional contact with the

ring if the shield be of metal. The projections and the cams on the crank-shaft are so proportioned and arranged in relation to the crank of the shaft that the projections will  
 5 engage with the heels of the knockers, so as to actuate the knockers while the pawls connected to the cranks are out of engagement with the ratchets of the drum and are being moved into position to engage with said  
 10 ratchets, and so that the cams on the same shaft will hold the knockers out of engagement with the dust-collecting tubes while the pawls are pulling on the ratchets to revolve the drum. A single shaft is thus caused to  
 15 actuate the said several parts, so that they will operate in the manner described. This very much simplifies the machine, and at the same time insures the parts being moved in proper unison or time, and the friction is reduced to the minimum because of the comparatively few parts employed. The arrangement of the driving mechanism for the drum and the other parts at the top of the machine leaves the bottom and the opposite sides of  
 20 the drum and its dust-collecting tubes free and unobstructed, and dispenses entirely with the necessity of any outside framing around or about the drum and its collecting-tubes.

By constructing the dust-collector as described all parts of the collector are exposed in view of the operator and are readily accessible from the outside, and parts can be removed and replaced when necessary without taking the entire collector to pieces.

30 I do not claim in this application features which are disclosed in and form the subject-matter of my application filed July 20, 1895, Serial No. 556,615.

Having described my invention and set forth its merits, what I claim is—

1. In a dust-collector, the combination of a rotatable drum provided with openings in its periphery, and dust-collecting tubes provided at their lower ends with rings to keep the  
 45 tubes at that end distended, said rings being adapted to be inserted endwise through the openings in the drum and then turned to prevent the withdrawal of the tubes from the drum, substantially as and for the purposes  
 50 described.

2. In a dust-collector, the combination of a rotatable drum having elongated openings formed in its periphery, and dust-collecting tubes provided at their lower ends with rings to keep said ends distended, the elongated openings in the drum permitting the rings to be inserted endwise and then turned to secure the tubes to the drum, substantially as and for the purposes described.

3. In a dust-collector, the combination of a rotatable drum, a cut-off chamber in the upper portion of the drum, a series of dust-collecting tubes arranged radially of the drum and communicating with the interior of the  
 65 drum, knockers arranged to impart blows to the tubes lengthwise thereof while the tubes are over the cut-off chamber, a rotatable

shaft extending lengthwise of the drum, transversely across the outer ends of the tubes, and provided with a cam to engage the knockers to keep the same out of engagement with the tubes as the drum rotates and with projections to actuate the knockers after the cam releases the knockers and the drum is at a state of rest, substantially as and for the  
 75 purposes described.

4. In a dust-collector, the combination of a rotatable drum provided with ratchet-teeth at its end, a cut-off chamber in the upper portion of the drum, a series of dust-collecting  
 80 tubes arranged radially to the drum and communicating with the interior of the drum and connected together at their outer ends, a rotatable crank-shaft extending lengthwise of the drum, transversely across the outer ends  
 85 of the tubes, knockers arranged to impart blows to the outer ends of the dust-collecting tubes, a pawl connected to the crank of said shaft and arranged to engage the ratchet at the head of the drum, projections connected  
 90 to said crank-shaft and arranged to engage said knockers to actuate the same while the pawl is out of engagement with said ratchet and is being moved by the shaft into position to engage the same, and means for holding  
 95 the knockers out of operation while said crank-shaft is pulling on the pawls to revolve the drum, substantially as and for the purposes described.

5. In a dust-collector, the combination of a  
 100 rotatable drum provided with ratchet-teeth and having dust-collecting tubes arranged radially of the drum and communicating with the interior thereof, a rotatable crank-shaft arranged lengthwise of the drum, transversely  
 105 across the outer ends of the tubes, and having a pawl connected to the crank and arranged to engage the teeth of the drum, knockers arranged to impart blows to the dust-collecting tubes, projections on the crank-shaft  
 110 arranged to engage said knockers to actuate the same while the pawl is out of engagement with the ratchet of the drum and is being moved by the crank-shaft in position to engage the ratchet, a drive-shaft parallel to the  
 115 crank-shaft, and a pinion and toothed wheel connecting the two shafts, substantially as and for the purposes described.

6. In a dust-collector, the combination with a rotatable drum provided with ratchet-teeth  
 120 at opposite ends and having dust-collecting tubes, a shaft supported at the upper portion of the drum and provided with knockers to impart blows to said dust-collecting tubes, a shaft adjacent to the knocker-shaft provided  
 125 at one end with a toothed wheel having a crank-pin and at the opposite end with a crank, pawls connected respectively to the crank-pin of the toothed wheel and to the crank at the opposite end of the shaft and arranged to engage the teeth of the drum, cams  
 130 on said crank-shaft arranged to engage the knockers and hold the same out of engagement with the dust-collecting tubes as the

drum rotates, projections on the same shaft arranged to actuate the knockers while the rotatable drum is at rest, and a drive-shaft provided with a pinion meshing with the teeth  
5 of the wheel on the crank-shaft, substantially as and for the purposes described.

7. In a dust-collector, the combination with the rotatable drum carrying dust-collecting tubes, knockers to impart blows to said tubes,  
10 and a shaft carrying cams to actuate the knockers, of a drip-cup located between said cams and dust-collecting tubes to prevent oil dripping onto the collecting-tubes, substantially as and for the purposes described.

15 8. In a dust-collector, the combination with

the rotatable drum carrying dust-collecting tubes, a shaft supporting knockers to impart blows to the tubes and a shaft carrying cams to actuate the knockers, of a drip-cup connected at one point to the knocker-shaft and  
20 at another with the cam-carrying shaft and located between the cam and dust-collecting tubes to prevent oil dripping on the tubes, substantially as and for the purposes described.

In testimony whereof I affix my signature  
25 in presence of two witnesses.

FAUSTIN PRINZ.

Witnesses:

ROBT. W. OLDENBURG,

WM. F. FILTER.