

No. 630,307.

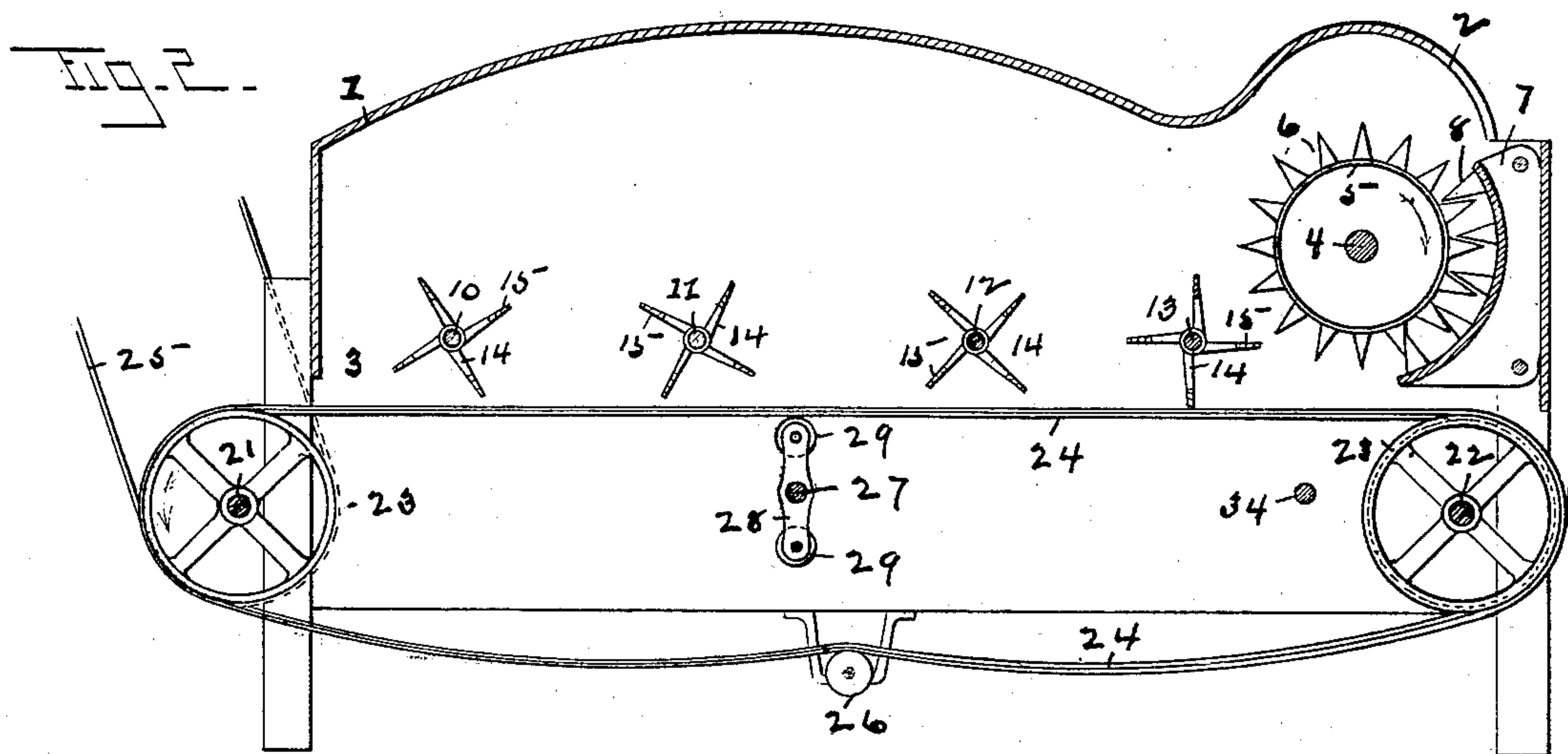
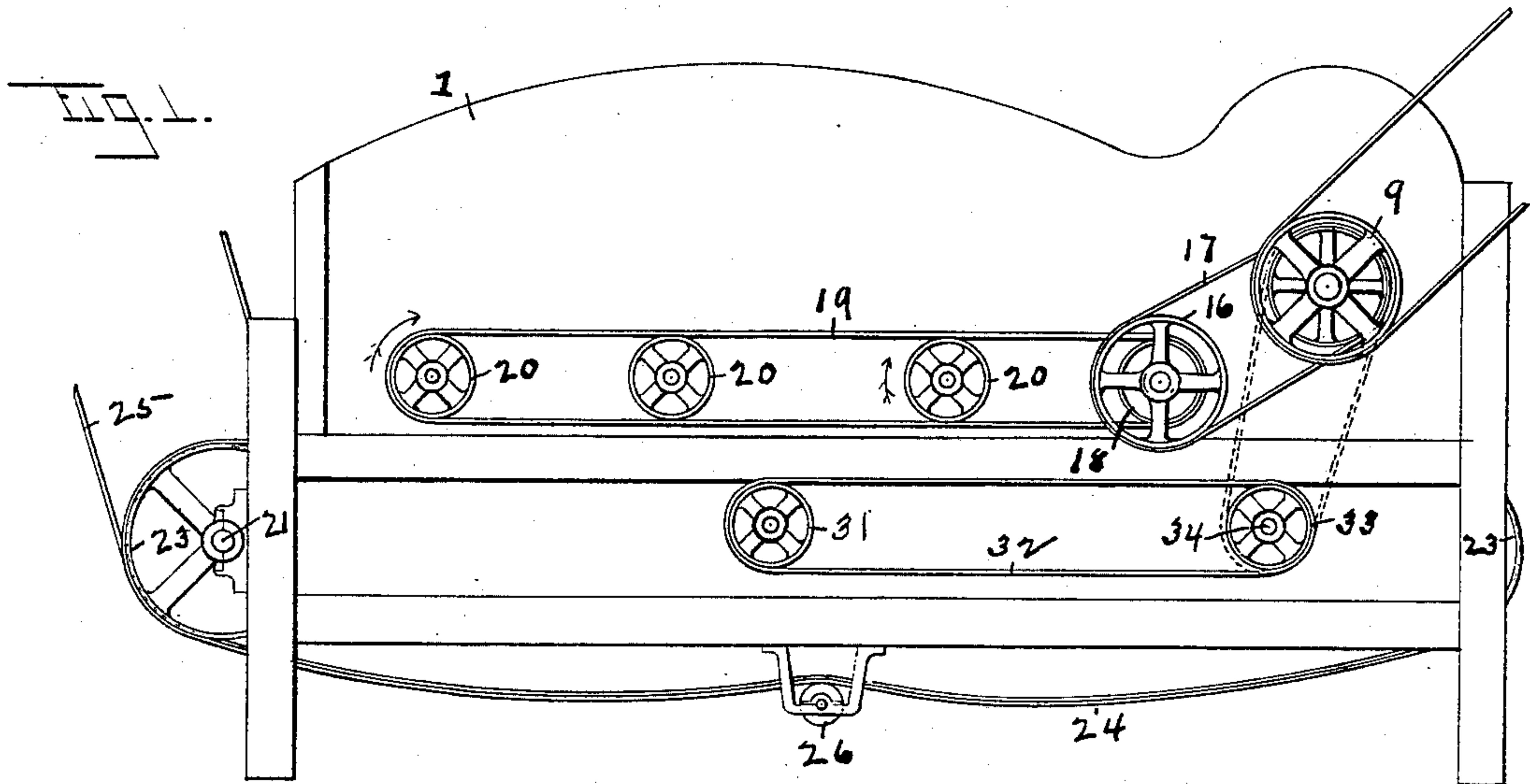
Patented Aug. 1, 1899.

A. A. WHEAT.
RAG DUSTING MACHINE.

" (Application filed Feb. 24, 1897.)

(No Model.)

2 Sheets—Sheet 1.



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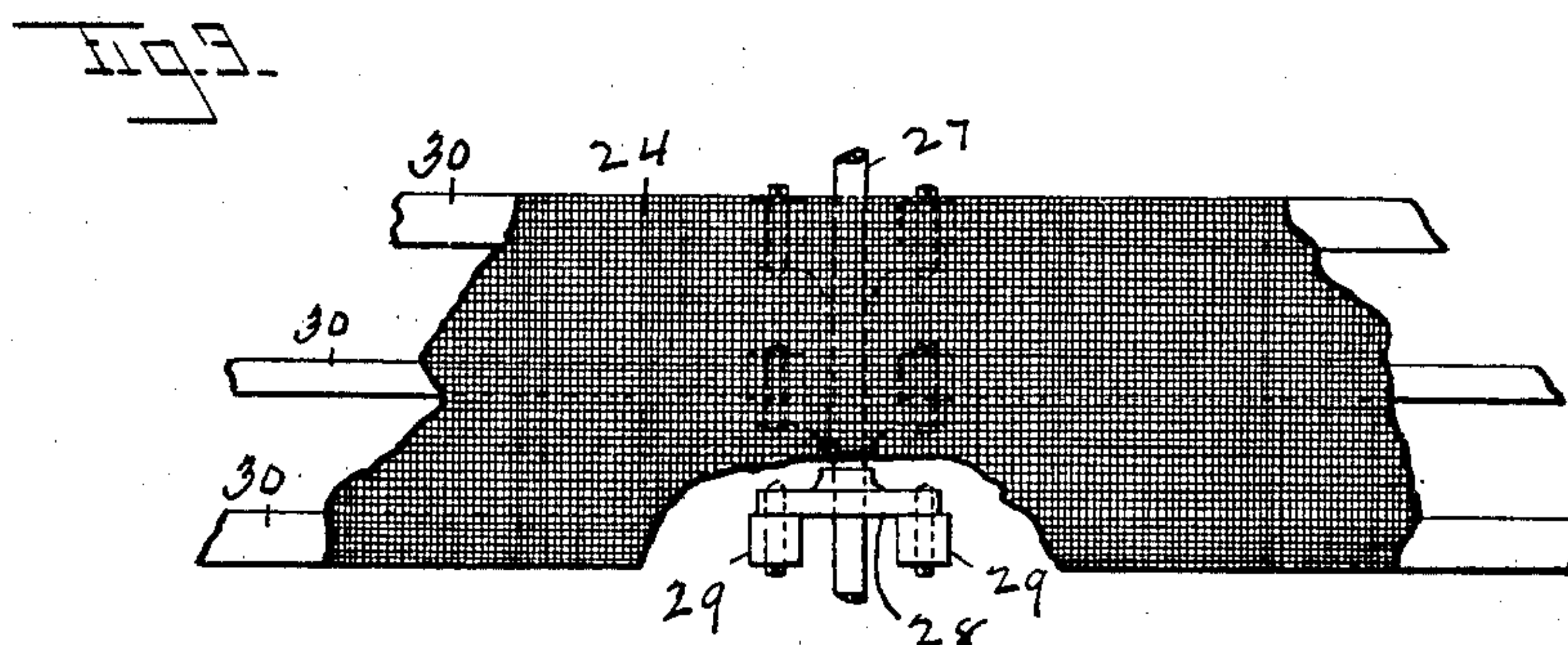
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UNITED STATES PATENT OFFICE.

ALLEN A. WHEAT, OF MITTINEAGUE, MASSACHUSETTS.

RAG-DUSTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 630,307, dated August 1, 1899.

Application filed February 24, 1897. Serial No. 624,888. (No model.)

To all whom it may concern:

Be it known that I, ALLEN A. WHEAT, a citizen of the United States, residing at Mittineague, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Rag-Dusting Machines, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

My invention relates to machines used in paper-mills for removing dust from rags preparatory to their being made into pulp; and it has for its object to provide a machine for this purpose by means of which the dusting operation can be performed more quickly and much more thoroughly than has been possible heretofore.

To this end my invention consists in the machine constructed and operating as hereinafter fully described, and particularly pointed out in the claims.

Referring to the drawings, in which like numerals designate like parts in the several views, Figure 1 is a side elevation of a machine embodying the invention. Fig. 2 is a longitudinal section thereof. Fig. 3 is a detail showing a portion of the carrying-apron and the means for imparting a shaking movement thereto.

The numeral 1 designates the frame or casing of the machine, which incloses the operative parts of the machine and forms a practically dust-proof chamber to prevent the escape of the dust into the room in which the machine is located. Said frame 1 is provided at one end thereof with the inlet-opening 2 for the rags and at its opposite end with the outlet-opening 3. A shaft 4, journaled on the frame adjacent to said inlet-opening, carries the cylinder 5, provided with a series of radially-projecting blades 6, and a bed-piece 7, mounted upon the frame and concentric with said cylinder, carries a series of corresponding blades 8, which are arranged alternately with those on the cylinder, whereby said blades will be caused to intermesh as the cylinder revolves in such manner as to effectually open out the rags fed to the machine. The shaft 4 carries a band-pulley 9, by which motion is transmitted thereto by belt from a power-shaft, and also carries other band-pulleys by which the motion of said shaft is

transmitted to other shafts of the machine, as will be presently described.

The numerals 10, 11, 12, and 13 designate four beater-shafts extending transversely across the frame at substantially equal distances apart, said shafts being provided within the casing with a series of radially-disposed arms 14 near each end thereof and with cross-bars 15 at the outer ends of said arms, which arms and cross-bars of said shafts thus form a series of beaters, the office of which is to thoroughly beat the dust out of the rags and to pass the latter toward the rear end of the machine. At one end of the shaft 13 is a band-pulley 16, which is connected by a belt 17 with a pulley on shaft 4 and also a pulley 18, and a belt 19, passing about said latter pulley and about a pulley 20 on shaft 10 and engaging by friction similar pulleys 20 on the shafts 11 and 12, transmits the motion of shaft 13 to said shafts 10, 11, and 12 in the direction indicated by arrows in Fig. 1. Shafts 21, 22, located at the opposite ends of the machine below the plane of the beater-shafts, carry drums 23, about which passes an endless carrier 24, preferably composed of open-mesh woven wire to permit the dust shaken from the rags to pass downwardly there-through to the bottom of the casing. A band-pulley on the shaft 21 receives a belt 25, by which motion is transmitted to said shaft and said carrier from a power-shaft, the motion of the carrier, however, being a very slow one. An idler roll 26, located midway between the drums 23, supports the carrier in such manner as to prevent undue sagging thereof at its lower side.

The carrier 24 serves as a perforated bed to retain the rags in position to be acted upon by the series of beaters, and to still further agitate the rags I give to said bed a shaking motion, as follows: A shaft 27, located beneath the upper side of the carrier, carries a plurality of cross-arms 28, preferably three in number, as shown, to the outer ends of which arms are secured studs, upon which are mounted antifriction-rolls 29, and by the revolution of said shaft said rolls are brought successively into contact with the under side of the carrier, thereby imparting to the latter an up-and-down shaking movement. I pre-

fer to locate two of said cross-arms beneath the carrier at its opposite edges and a third one beneath the center thereof, as shown, and to prevent undue wear of the carrier by the action of the rolls 29 I prefer to line the under or inner side of the carrier in the planes of said rolls with strips 30, of leather or other suitable material, as shown in Fig. 3, against which the rolls bear in making their contact.

The shaft 27 carries a band-pulley 31 at one end, which receives a belt 32, passing about a pulley 33 on a cross-shaft 34, said shaft carrying at its opposite end a similar pulley, which is connected by belt with a pulley on shaft 4, as shown by broken lines in Fig. 1, whereby motion is transmitted from shaft 4 to said shaft 27.

The rags being fed to the machine through the inlet-opening 2 are first seized by the blades 6 of cylinder 5 and carried downwardly through the nest of blades on the bed-piece 7, the conjoint action of which blades is to effectually open out the rags, but not to cut them, the blades having their edges made blunt. After passing through said nest of blades the rags are thrown by the revolving movement of the cylinder rearwardly to a point where they are engaged by the beater-arms and bars 14 15 on shaft 13, which throw them down upon the perforated carrier 24, and thence rearwardly and upwardly to a point where in falling they are engaged by the beaters on shaft 12, which repeat the operation and pass them onto the beaters on shaft 11, and so on until they are finally expelled by the action of the beaters on shaft 10 through the outlet-opening 3 into any desired receptacle. In addition to the thorough beating which the rags thus receive from the series of beaters such of them as fall upon the carrier 24 receive a shaking movement from the latter by reason of the action of the cross-arms and rolls on shaft 27, so that by the time the rags are expelled from the machine they are thoroughly dusted and are ready to be made into pulp. The dust thus eliminated from the rags falls through the perforated carrier to the bottom of the casing, whence it is removed through a suitable opening provided therefor in the casing.

The above-described action of the beaters would be substantially the same if the perforated carrier or bed were stationary instead of movable longitudinally; but to insure the final expulsion from the machine of any rags which may escape the direct contact of all of the beaters I prefer to impart a slow movement to the said carrier, as described.

The number of beater-shafts employed can be varied as may be desired, and various forms of means for imparting motion to said shafts, as well as to the driving-drum for the endless carrier, can be utilized within the spirit of my invention.

By the use of a machine constructed as herein described rags can not only be more thoroughly dusted than by the machines here-

tofore used, but also in much less time, thereby securing a material saving in the cost of the paper manufactured therefrom.

It will be understood that this machine follows in the process of paper-making the operation of the rag engine or machine which cuts and comminutes the rags and at the same time more or less fills them with dust and that it is the object of my invention not to supplement the rag-engine in respect to the further cutting or comminuting of the rags, but simply to remove from the cut rags and without further cutting them the dust which they carry. In order that this may be effectively done, it is necessary that the cut pieces of rag be fully opened, separated from each other, and tossed and beaten or whipped about in their separated and opened condition in an inclosed case, and therefore my invention involves, first, the use of means for opening out the cut pieces without tearing them, comprising a large number of rapidly-rotating blunt openers which are caused to feed the rags through a large number of stationary blunt beaters and in the feeding open them out to a flat or open condition; second, in a vibrating feeding-screen which slowly advances the open rags through the case and upon which the opened rags are thrown by the revolving openers, and, third, in a series of rapidly-rotating dusters or stirrers which are arranged to strike or beat the rags and while they are thus advancing to lift and throw them upward into the chamber of the case, and thus expose new surfaces to the action of the dust-removing devices and free them from dust, which escapes or is drawn from the case through the meshes of the screen. To accomplish this, it is not only necessary that the rags should be advanced by the screen, but it is also necessary that there should be an air-space above the dust-beaters, in which the bulk of rags may be lightened and swirled to assist in the escape of dust from them.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a dusting-engine for the treatment of cut rags preparatory to their conversion into paper-pulp, the combination of devices for opening out the cut rags consisting of a large number of rapidly-rotating blunt opening-blades, a series of stationary blunt opening-blades arranged upon a line vertically curved with respect to the rotating openers, a slowly-moving endless vibrating screen the upper part of which extends through the chamber of the machine from a point in advance of the said rag-opening devices to a point beyond the rear end of the machine, and the lower part of which extends beneath the case of the machine to the forward end thereof, two wheels for supporting said screen, one within the case of the machine at the forward end thereof and the other without the case of the machine at the rear end thereof, a series of rapidly-rotating rag-beaters arranged over

said screen to strike the opened rags thereon, toss them upward therefrom and swirl them in the cavity-case over the beaters to free the cut rags from dust while they are being slowly advanced through the case, the said machine-case being shaped to provide an enlarged chamber over the beaters and having near one end a feed-opening above the converging point of the openers and through which the cut rags are fed to the opening devices and having at its opposite end at the point where the screen leaves the case an opening through which the beaten rags are fed from the machine by the screen, and means for rotating the opener and beater blades and for moving and vibrating the screen, as and for the purposes set forth.

2. In a rag-dusting engine, the combination with devices for opening out the cut rags, of a slowly-moving endless screen the upper part of which extends through the chamber of the machine from a point in advance of the rag-opening devices to a point beyond the rear end of the machine, means for moving and vibrating said screen, a series of rapidly-rotating rag-beaters arranged over said screen, and a casing raised above the said beaters to provide an enlarged chamber and having at one end a feed-opening adjacent to the rag-opening devices.

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Witnesses:

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