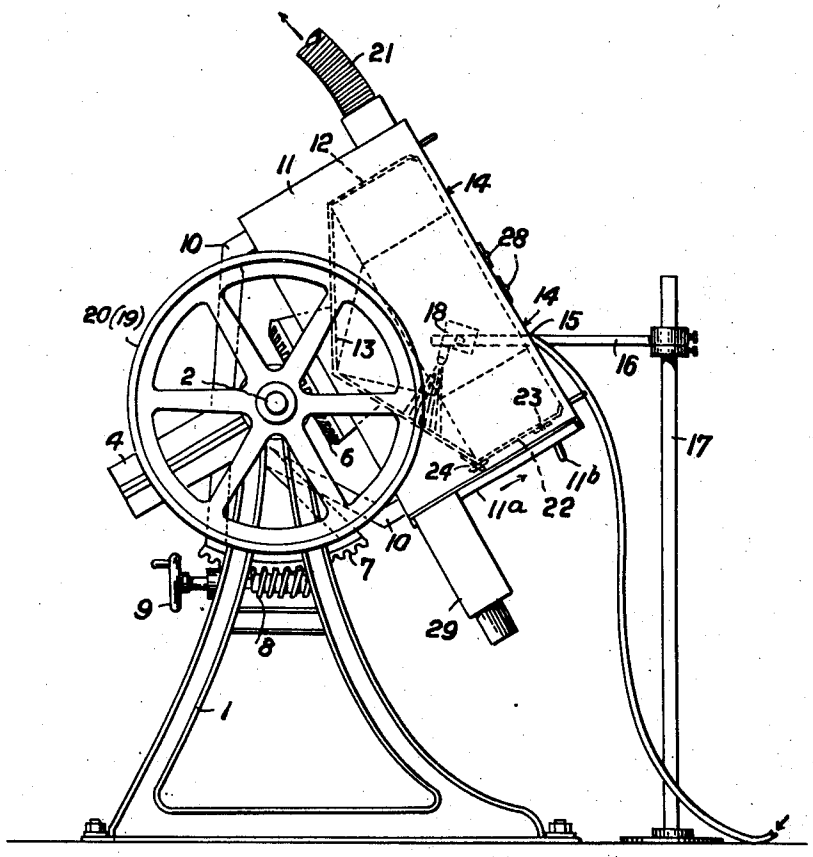
Dec. 18, 1928. 1,695,362

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SEPARATING APPARATUS

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Fig. 1.



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Fig. 2.

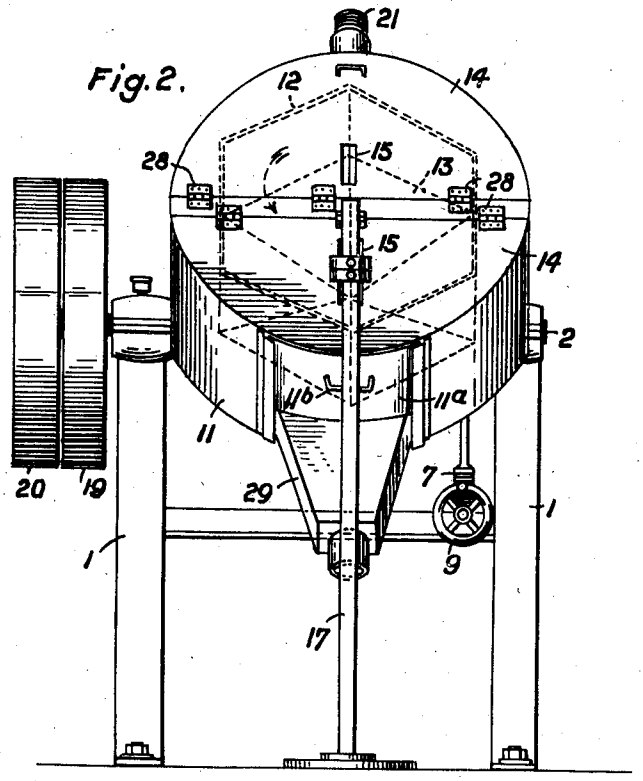
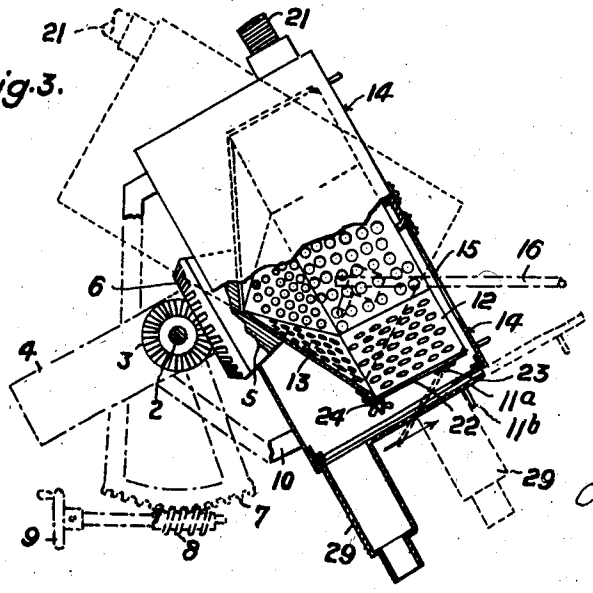


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SEPARATING APPARATUS.

Application filed February 24, 1927, Serial No. 170,723, and in Germany April 9, 1926.

This invention relates to improvements in known apparatus in which, in the treatment of small iron goods and the like by means of a jet of compressed gases directed against them, spraying bodies being mixed with the gases, the procedure is such that a rather large number of the pieces of work are placed promiscuously inside a container, the position of which is continually changed, while the pieces of work, sometimes falling freely, are forced through the zone traversed by the treatment jet, and are thus worked up in the desired manner.

In carrying out this method of treatment use has hitherto preferably been made of a drum which is rotatable about a horizontal axis and upon the ends of which, in front of a central aperture provided in the wall of the drum, is arranged the nozzle that discharges the treatment jet into the interior of the drum, the said nozzle being arranged either immovably or else in such a way that it executes oscillating movements in the plane of the axis of the drum.

Experience has shown that this method of working the apparatus is accompanied by numerous disadvantages. In particular the treatment jet is always effective in an inclined line of impact deviating greatly from the perpendicular and more or less flatly oblique to the axis of the drum. The disadvantages thereby arising may be obviated if according to the invention the pieces of work are deposited and moved in such a way that during the rotation of the drum, which is supported obliquely in space, they can roll only around themselves upon one of the prismatic sides of the jacket and the partial surface adjacent thereto of the pyramid-shaped bottom, in which case no free fall occurs, but the mass of material slides in the manner of a rolling track in a rather flat layer which is to some extent uniformly spread out upon the support.

Owing to this change in the supporting and the moving the following result is obtained:—The path from the nozzle to the material to be treated is considerably shortened. Owing to this the spraying bodies arrive upon the pieces of work with considerably greater velocity than in the case of longer obliquely directed flights. Their force is thus not weakened as it is in the case of long oblique paths. If therefore the spraying bodies, as is the case in the formation of coatings, are to remain adhering to the pieces of work, the power of adhesion becomes greater. Furthermore, if the spraying bodies consisting of molten metal are melted by a flame formed at the mouth of the spraying nozzle, the pieces of work are highly heated by the mouth of the nozzle being brought near to them, as in the case of the apparatus according to the afore-mentioned patent. By this means the mass of metallic particles striking in such a thinly liquid state is greatly flattened out and distributed, and as the technologist is aware, the grain becomes more beautiful and more uniform.

The shortening of the flights of the particles results in shorter durations of treatment and this in turn results in saving sensitive pieces of work from damage, more particularly such as are equipped with screw-threads of fine pitch or with sharp edges or the like. Considerable advantages from the point of view of economy are also offered by the new apparatus. These advantages consist firstly in a lower consumption of compressed gases (compressed air for atomization, combustible gas, oxygen and the like), and secondly in decreased labour and in increased number of the charging of the machine.

In Figs. 1 to 3 of the accompanying drawings is illustrated one constructional example of the invention.

Fig. 1 shows a side elevation,

Fig. 2 a front elevation, and

Fig. 3 a sectional elevation through the drum without the frame.

In a frame 1 is horizontally journalled a shaft 2, upon which is mounted a bevel wheel 3, which meshes with a bevel wheel 6. The bevel wheel 6 is secured to a stub axle 5, which is supported in the obliquely abjustable footstep bearing 4. This bearing is carried by a worm-wheel sector 7, which by the actuation of a worm 8 equipped with a hand-crank 9, can be adjusted into various inclined positions, the carrying arms 10 of the footstep bearing 4 transmitting the inclined positions to the drum 11 secured to the carrying arms 10. The drum 11 contains in its interior a charge drum 12 with a prismatic periphery. The drum 12 is secured by its pyramidal bottom 13 to the stub axle 5 of the footstep bearing 4. The charge drum 12, 13 is perforated on all sides, but has no cover A removable cover 14 is however provided upon the outer drum 11 surrounding the

charge drum 12, 13 and serves when in an opened condition for the charging of the inner drum 12, 13. Furthermore, the cover 14, which moveover is preferably constructed in a plurality of parts, in which case the parts are connected by hinges 28, comprises an aperture 15. Through the latter a cantilever 16 on a stand 17 erected in front of the drum can pass into the interior of the charge drum 12.

To the cantilever 16 is secured the apparatus that discharges the treatment jet, a metal-spraying pistol for example, in such a way that the jet leaving the nozzle strikes perpendicularly upon the surface of the mass of material that faces it.

If the shaft 2, by actuation of a driving belt placed round the fast pulley 19, is rotated, in the direction of the arrow shown, about the stub axle 5, the mass of material in the charge drum, under the influence of this rotation and of the prismatic periphery or pyramidal bottom, will continually arrange itself in such a way that the individual bodies roll over one another, but the mass as a whole slides slowly downwards like a rolling track, continues moving, and then rolls upwards again. All this occurs in a uniform, thin layer.

Now it is possible, by adjusting the obliquity of the drum 12, 13, to allow this rolling work to proceed in such a way as to take into consideration the distinctive character of the shaping of the individual parts and also of course the speed with which the change of position is to proceed. This different adjustment of the drum 12, 13, and its contents must of course also be accompanied by a corresponding adjustment of the direction of the cantilever arm 16 and of the jet-discharging apparatus 18 secured thereto.

The removal of the dust from the interior of the drum 12, 13 may be effected by connecting the drum 11, to an exhauster, a movable suction pipe 21 permitting of the movements of the drum.

The charging of the inner drum 12 is effected, as already mentioned, by opening the movable parts of the cover 14. The emptying of the completely metallized contents out of the charge drum 12 is effected by the aid of a slidable part of the peripheral wall of the drum 11. This part, constructed for example as a sliding door 11^a, is provided with handles 11^b, by the raising of which the door can be slid into the position shown in dotted lines in Fig. 3. Upon this displacement of the sliding door 11^a the inner drum 12 is laid open. By releasing the closure 24 a valve-like part 22 of the pyramidical bottom 13 is opened, or else a correspondingly shaped part of the cylindrical surface of the drum 12. The contents of 12 then drop out of the drums, which are thus laid open, into a transporting vessel held ready for them. The funnel attachment 29 of the sliding door 11^a serves for the discharging of any spraying bodies, which may have passed during the working of the machine out of the drum 12 into the drum 11.

What I claim is:—

1. Apparatus for the treatment of a plurality of pieces of work by means of a jet of spraying bodies mixed with gases under pressure, comprising an obliquely supported rotatable container for the articles to be treated, said rotatable container being open at the upper end, a non-rotatable casing co-axial with and enclosing said rotatable container, means for varying the inclination of the common axis of said container and said casing, a spraying nozzle for discharging at the articles to be treated a jet of gases under pressure mixed with spraying bodies, a cover closing the upper end of said non-rotatable casing, said cover being formed with an aperture through which the spraying nozzle can be introduced, and means for adjusting the spraying nozzle at different inclinations to the bottom surface of the rotatable container so that the spraying nozzle can send out its jets as perpendicularly as possible to the parts of the rotatable container upon which they impinge.

2. Apparatus for the treatment of a plurality of pieces of work by means of a jet of spraying bodies mixed with gases under pressure, comprising an obliquely supported rotatable container for the articles to be treated, said rotatable container having a prismatic periphery and a pyramidal bottom, said rotatable container being open at the upper end, means for opening said rotatable container at the under side for the purpose of discharging its contents, a cylindrical non-rotatable casing co-axial with and enclosing said rotatable container, means for opening said non-rotatable casing at the under side for the purpose of discharging its contents, means for varying the inclination of the common axis of said container and said casing, a spraying nozzle for discharging at the articles to be treated a jet of gases under pressure mixed with spraying bodies, a cover closing the upper end of said non-rotatable casing, said cover being formed with an aperture through which the spraying nozzle can be introduced, and said cover being constructed in a plurality of relatively movable parts so that it can be opened, and means for adjusting the spraying nozzle at different inclinations to the bottom surface of the rotatable container so that the spraying nozzle can send out its jets as perpendicularly as possible to the parts of the rotatable container upon which they impinge.

In testimony whereof I have signed my name to this specification.

CARL BOURGES.