

Jan. 4, 1938.

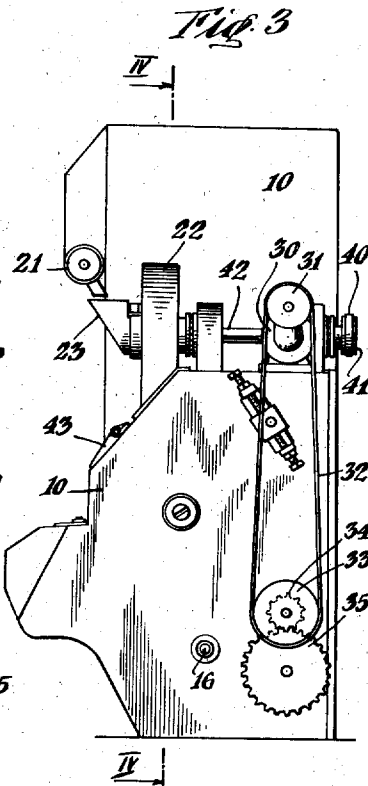
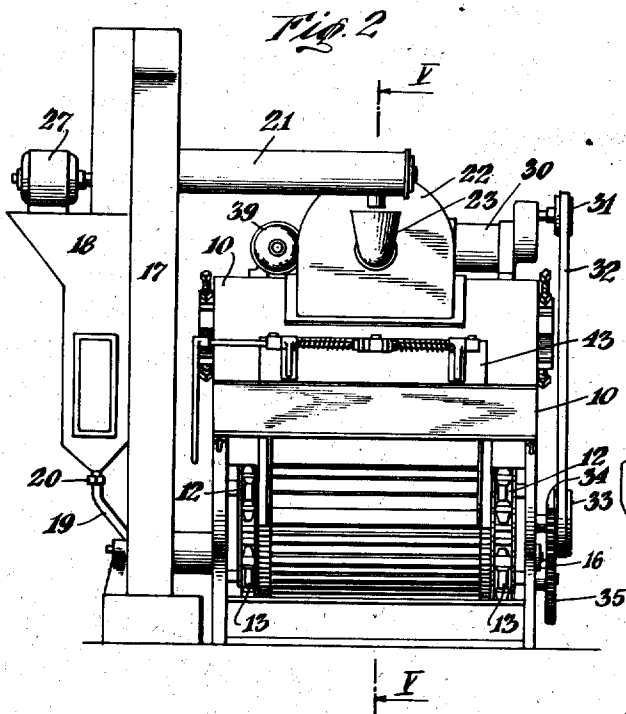
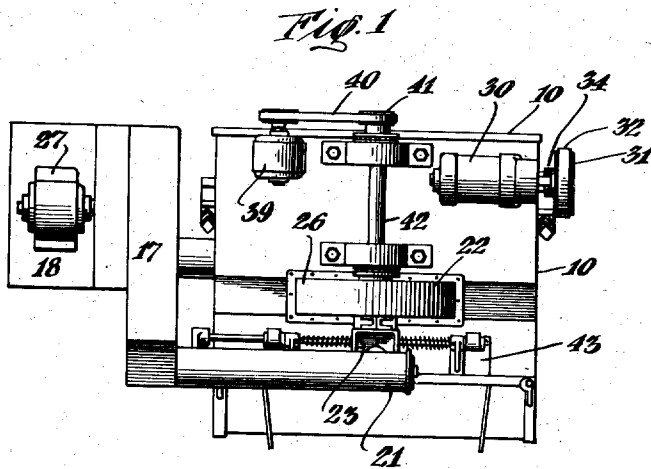
L. D. PEIK

2,104,055

ABRADING APPARATUS

Filed Aug. 23, 1933

2 Sheets-Sheet 1



INVENTOR
Louis D. Peik
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ATTORNEYS

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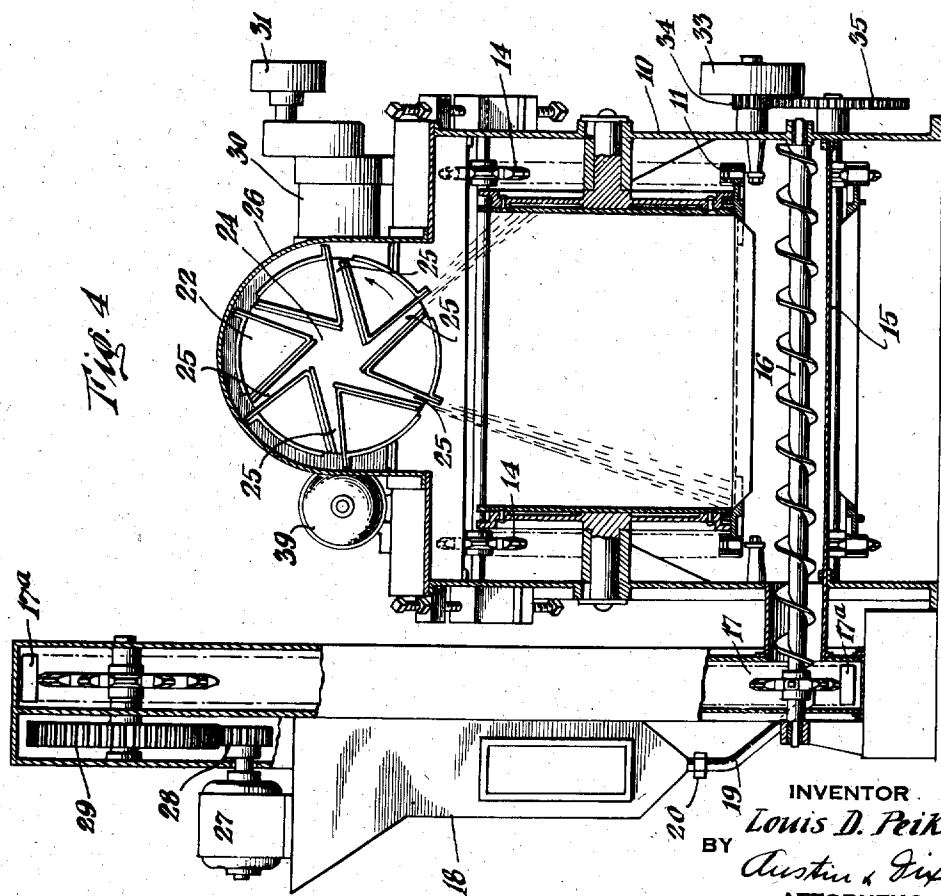
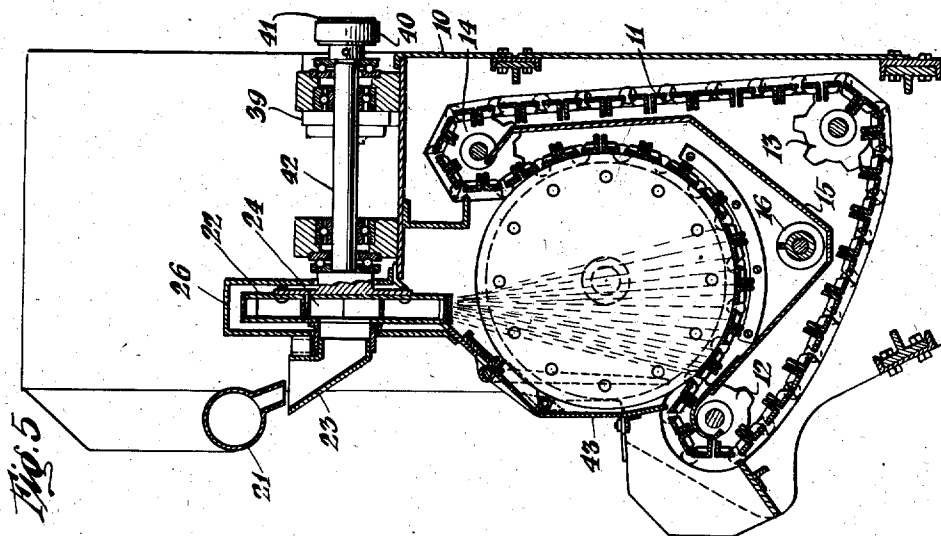
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ABRADING APPARATUS

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2 Sheets-Sheet 2



INVENTOR
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UNITED STATES PATENT OFFICE

2,104,055

ABRADING APPARATUS

Louis D. Peik, Mishawaka, Ind., assignor to The American Foundry Equipment Company, Mishawaka, Ind., a corporation of Delaware

Application August 23, 1933, Serial No. 686,382

2 Claims. (Cl. 51—9)

The invention relates to abrading apparatus, and more particularly to a combination of tumbling apparatus and abrasive projector.

In the past, apparatus has been used wherein articles are treated by tumbling and at the same time a current of air carrying abrasive is discharged from nozzles upon the articles which are undergoing treatment.

In accordance with the present invention, tumbling apparatus (for instance apparatus similar to that described and claimed in Patent No. 1,882,442 for a Tumbling Mill, granted to me October 11, 1932) is combined with a mechanical abrasive projector, for instance, apparatus similar to that disclosed in my co-pending application, Serial No. 685,025, filed August 14, 1933), so that abrasive, without an appreciable quantity of accompanying air, is projected against the articles which are being treated. Thus, the present apparatus reduces the cost and minimizes the disadvantages of known combined tumbling and abrading apparatus. The cushioning action of air upon the abrasive is eliminated, because in the present apparatus the abrasive stream is not carried by air, which impinges upon the articles under treatment, is there compressed, and then reversed in its direction of travel with the result that it opposes the projection of the abrasive against the articles under treatment. Furthermore, the problem of disposing of large volumes of air, projected into the tumbling apparatus with the abrasive, is disposed of by means of the present invention. Finally a very much greater quantity of abrasive can be projected in a given time with a given size of projector and a given input of power, with an "airless" projector than is possible where an air stream is employed to carry the abrasive.

The invention also consists in certain new and original features of construction and combinations of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which—

Fig. 1 is a plan view of an apparatus constructed in accordance with the invention.

Fig. 2 is a front elevation of the apparatus illustrated in Fig. 1.

Fig. 3 is a side elevation of the apparatus as viewed from the right in Fig. 2.

Fig. 4 is an enlarged section on the line IV—IV of Fig. 3, and

Fig. 5 is an enlarged section on the line V—V of Fig. 2.

In the following description and claims various details will be identified by specific names for convenience, but they are intended to be as generic in their application as the art will permit.

Like reference characters denote like parts in the several figures of the drawings.

In the drawings accompanying and forming part of this specification, certain specific disclosure of the invention is made for purposes of explanation, but it will be understood that the details may be modified in various respects without departure from the broad aspect of the invention.

Referring now more particularly to the drawings, it will be seen that they show a casing 10 within which there is positioned a movable endless segmented belt 11 mounted on sprocket wheels 12, 13, 14, all as illustrated and described in the aforesaid Patent No. 1,882,442. An abrasive receiving pan 15 is disposed between the upper and lower portions of the movable belt 11 and a worm conveyor 16 is positioned in the lowest part of the abrasive receiving pan 15 for removing abrasive therefrom.

A conveyor 17 composed of scoops or buckets 17a of usual design is provided at the end of the worm conveyor 16 for elevating the abrasive conveyed by the latter to a point from which it may be reused.

An abrasive storage tank 18 is disposed above the low point of the conveyor 17 and a conduit 19 carries abrasive therefrom to the low point of the conveyor. A valve 20 may be positioned in the conduit 19. A tube 21 is provided adjacent the upper part of the conveyor 17 for carrying abrasive from the conveyor to an abrasive projector 22 which is mounted on the tumbler for projecting a stream of abrasive therein. The tube 21 deposits abrasive in a funnel member 23, which in turn conveys the abrasive by gravity to the abrasive projector, as here shown, to a central portion 24 thereof. A series of blades 25 extend from this central circular space 24 to the periphery of the projector and when the projector is whirled rapidly about its axis, any abrasive coming into the central circular space 24 will be thrown outwardly and projected from the wheel as it revolves. A shield member 26 prevents the abrasive, coming to the projector, from

being thrown out of the apparatus and away from the tumbler; but no obstruction is present between the projector and the tumbler. Thus, the abrasive is thrown into the tumbler and against the articles under treatment.

A motor 27 operates the conveyor 17 through a train of gears 28, 29. A motor 30, here shown as mounted on top of the casing 10, rotates a pulley 31, which through a belt 32 operates a second pulley 33 for driving movable belt 11. The worm conveyor 16 is driven from the conveyor 17 as will be obvious from Fig. 4.

The movable belt 11 is driven from a gear wheel 34, keyed to the shaft of the second pulley 33, which meshes with a gear wheel 35 on the shaft which carries the sprocket wheel 13. The sprocket wheels 12 and 14 merely idle, and the movable segment turns them as it is driven from the sprocket wheel 13. Obviously, other drive means might be employed for the movable segment.

A motor 39 drives the mechanical abrasive projector 22 in a counter-clockwise direction, as shown in Fig. 4, by means of a belt 40, a pulley 41 and a shaft 42, as will be readily seen by referring to Fig. 1 of the drawings.

In operation the tumbler is moved in a counter-clockwise direction as seen in Fig. 5, the articles therein tending to move upwardly to the right and falling downwardly again as their angle of repose upon the movable belt 11 is exceeded. The mechanical abrasive projector receives abrasive in its central circular space 24, and being whirled about, projects the abrasive through its throwing blades 25. Such abrasive as is projected away from the tumbler is received by the guard 26 and permitted thereby to fall into the tumbler. Abrasive projected into the tumbler strikes the articles being tumbled therein and cleans them. When a batch has been satisfactorily cleaned in the tumbler, the motor 39 is stopped, thereby stopping the projector; a door 43 at the front of the tumbler is opened; the motion of the movable belt 11 is reversed; and the articles are moved out of the tumbler.

Abrasive to replace that which has been used up is supplied through the tube 19, as has already been indicated by the description of the apparatus.

It will be readily seen that the abrasive blast continually acts over the entire width of the tumbling apparatus. This is not possible where air nozzles project a series of jets into a tumbler or onto a revolving platform where the articles

intermittently and repeatedly are subjected to the action of jets of abrasive material.

The apparatus herein described has been found to have great practical advantages over known apparatus for tumbling articles and at the same time cleaning them with a stream of abrasive. Articles may be cleaned in the present apparatus more thoroughly, in far less time, than has heretofore been possible; and a marked saving in power has been made.

While certain novel features of the invention have been disclosed and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. In a metal cleaning and tumbling apparatus, in combination, side walls, an endless conveyor belt adapted to describe an arc of a cylinder in its line of travel, said arm forming a chamber with said side walls, means for driving said belt and an abrasive throwing wheel above the chamber formed by said belt and side walls, said wheel being rotated in a plane transverse of the direction of motion of said belt, whereby abrasive will be distributed over the entire width of said belt from one of the side walls to the other.

2. An apparatus for cleaning metal castings and the like comprising a cleaning chamber, an endless conveyor mounted in said chamber for supporting castings to be cleaned, means for causing the casting supporting surface of the conveyor to travel in a substantially horizontal path for a limited distance and to then travel in a substantially vertical path for a limited distance whereby the castings supported on said surface first travel in a longitudinal direction and are then tumbled by the conveyor during its vertical travel back onto that portion of the conveyor traveling in a horizontal direction, and a centrifugal abrasive throwing wheel mounted in said chamber above the horizontal reach of said conveyor with its axis so positioned that the wheel rotates in a plane transverse to the direction of travel of said conveyor, whereby the abrasive discharged therefrom is directed in a concentrated stream having a sweep coextensive with the width of said conveyor against the various surfaces of the castings to be cleaned as they repeatedly travel for said limited distances in a horizontal direction.

LOUIS D. PEIK.

CERTIFICATE OF CORRECTION.

Patent No. 2,104,055.

January 4, 1938.

LOUIS D. PEIK.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 21, for the word "arm" read arc; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of February, A. D. 1938.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.

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