Aug. 8, 1933. M. W. EDMAN 1,921,914

DISINTEGRATING MACHINE

Filed Aug. 7, 1931 2 Sheets-Sheet 1

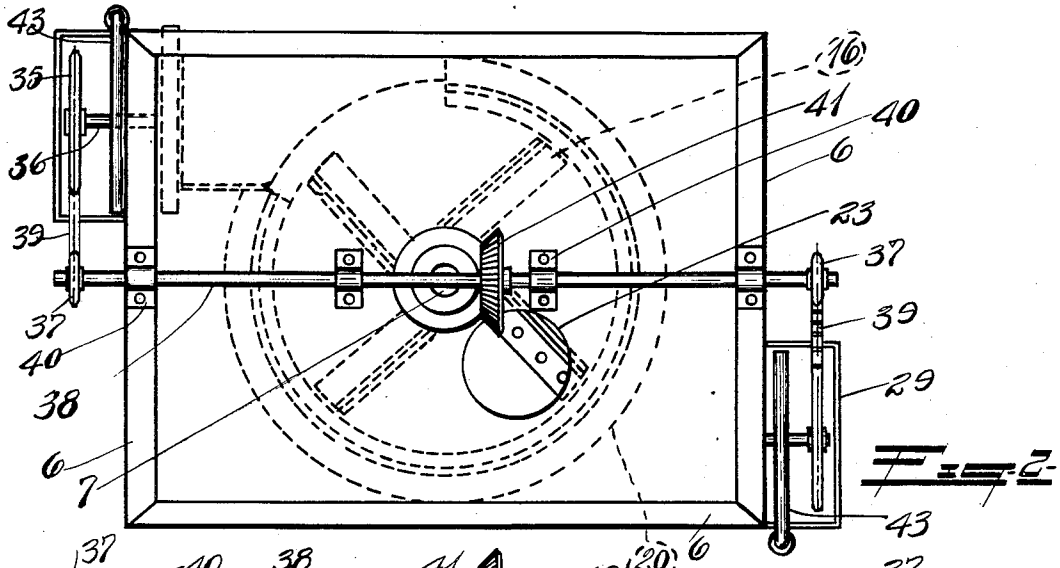


Fig. 2.

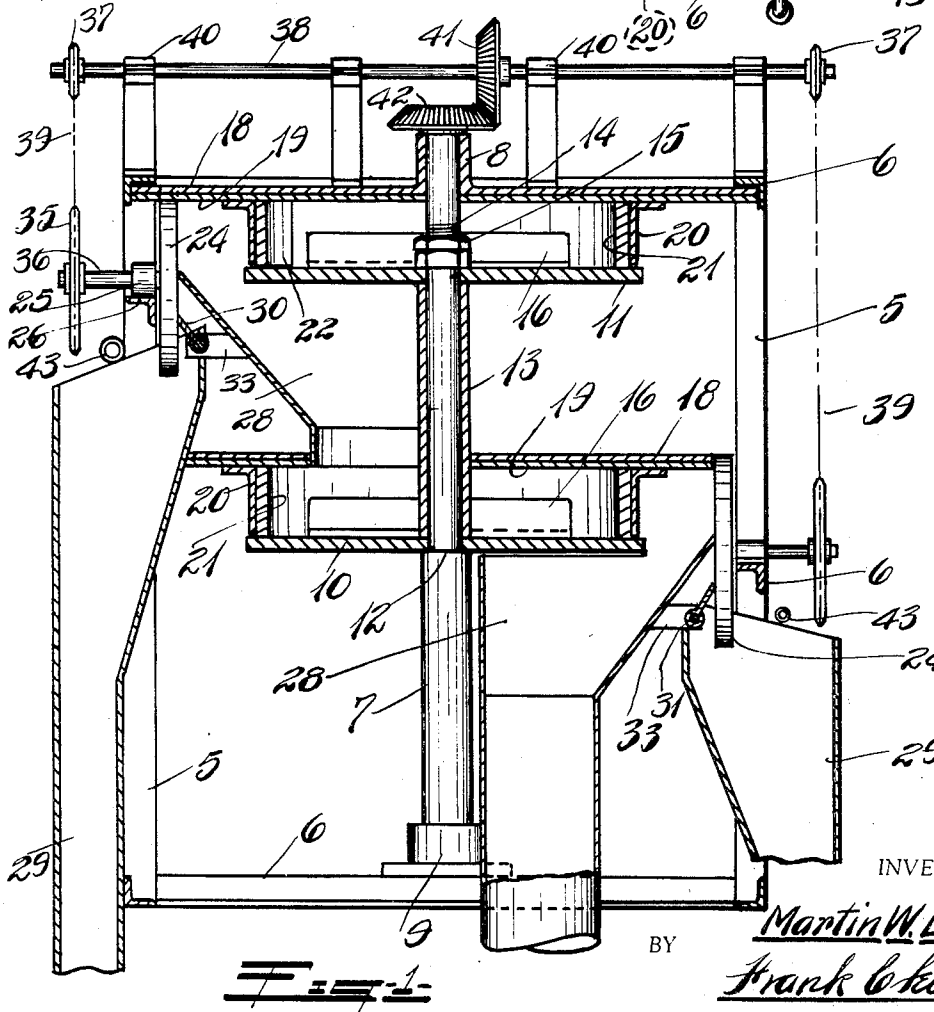


Fig. 1.

INVENTOR.
Martin W. Edman.
BY
Frank C. Kearman.
ATTORNEY.

Aug. 8, 1933. M. W. EDMAN 1,921,914

DISINTEGRATING MACHINE

Filed Aug. 7, 1931 2 Sheets-Sheet 2

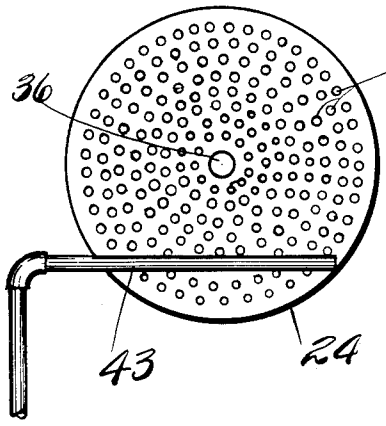



Fig 3.

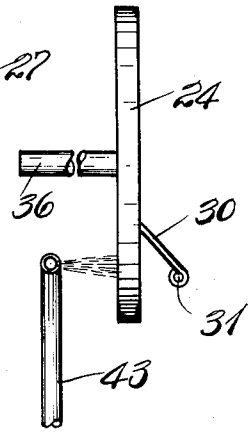



Fig 4

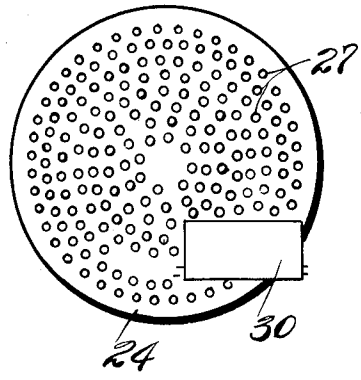



Fig 5

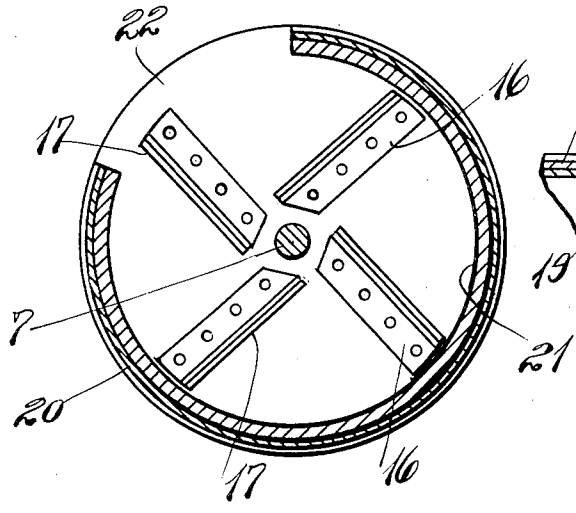



Fig 6

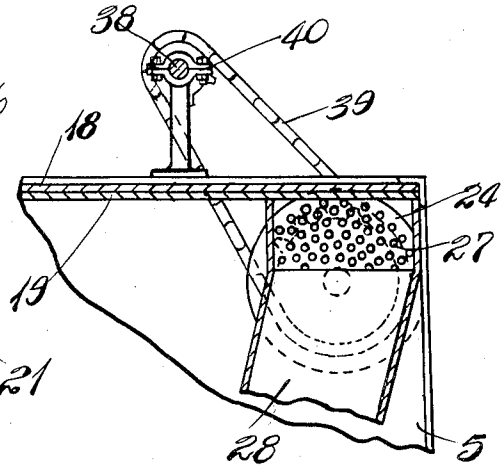



Fig 7

INVENTOR.
Martin W. Edman.
BY
Frank C Fearman.
ATTORNEY.

Patented Aug. 8, 1933 1,921,914

# UNITED STATES PATENT OFFICE

1,921,914

## DISINTEGRATING MACHINE

Martin W. Edman, Oxford, Mich.

Application August 7, 1931. Serial No. 558,230

14 Claims. (Cl. 83—46)

This invention relates to disintegrating machines, and more particularly to a machine for crushing soft stone, clay balls, and other undesirable material found in gravel.

The prime object of the invention is to design a simple, compact, and efficient machine of large capacity into which the material is fed, and provide means for throwing the material against a strike plate with sufficient force to crush and break up the soft stone, and clay balls contained therein so that when the gravel passes over a rewash screen the crushed soft stone and clay will be readily carried away with the water.

Another object is to provide a revolving strike plate, and provide means for the cleaning and removal of any material which may impinge or hang thereon.

A further object is to provide removable liners on the disc arms and rim so that they may readily be replaced when worn.

A still further object is to provide a machine of simple, rugged, and practical construction, which will have large capacity, occupy a minimum floor space, and in which all moving parts are of sturdy construction, insuring long wear with a minimum expense for maintenance.

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 drawing.

Fig. 1 is a side elevation of my improved disintegrating machine, parts being broken away to show the interior construction.

Fig. 2 is a top plan view.

Fig. 3 is an enlarged detail illustrating the back of the strike plate and the spray means.

Fig. 4 is an edge view thereof.

Fig. 5 is an opposite side view of the strike plate and the scraper.

Fig. 6 is a top plan view of the revolving disc, the rim being shown in section.

Fig. 7 is a fragmentary section view showing the strike plate, hopper, and driving means.

Soft stone in gravel is present in almost any size gravel, but it has been found that the greater percentage is approximately one half inch in diameter and larger. Consequently, if the soft stone one half inch and larger were removed by breaking it up, and then screening the gravel over a one half inch screen, this soft stone would screen through and be discarded, and the gravel would then be suitable for all commercial purposes. Naturally there is some fragmentation of the harder stone in the material, but such fragmentation is so small as to be negligible, and I have therefore perfected a machine which will disintegrate this soft stone, clay balls, and other deleterious matter in any size gravel.

Referring now more particularly to the drawings, the numeral 5 indicates the uprights of a preferably structural frame suitably braced and secured together by means of cross members 6, a centrally disposed vertical shaft 7 is provided as shown, and is journaled in bearings 8 and 9 respectively in the usual manner.

Disc members 10 and 11 are mounted on said shaft in spaced apart relation, said shaft being shouldered as shown at 12 to accommodate the disc 10, a sleeve 13 being mounted on the shaft above the disc, the upper end of said sleeve forming a bearing for the upper disc 11, said shaft being threaded as at 14, and a lock nut 15 serves to clamp the members rigidly on the shaft.

Suitable angles 16 are secured to the face of each disc and divide it into sectors, the angle radiating from the center of the disc, the upstanding leg of each angle having a liner 17 secured to the face thereof so that it can be readily replaced when worn.

A plate member 18 is mounted in the frame directly above each disc, and a liner 19 is rigidly secured thereto, an angle member 20 being secured to said plate and liner and is bent to form a rim for the disc, a relatively heavy liner 21 being secured to the inner surface of the angle 20, said angle and liner being provided with an opening 22 so that the material may be discharged as the disc is rotated.

Material is fed to the machine through a feed spout 23, falling onto the revolving disc 11, thence being thrown outwardly and against a revolving "strike" plate 24 which is journaled in a suitable bearing 25 mounted on the cross members 26, said plate being provided with a plurality of perforations 27 so that clay balls, soft stone and other foreign matter will be broken up and forced through the perforations, and either fall into a downspout 28 which leads to the disc member 10, or the clay adhering to the disc, being rotated away from the flow of material, will be scraped into a clay chute 29 as will be hereinafter more fully described.

Suitable scraping means is provided for clean-

ing the face of the "strike" plate, and this comprises a blade member 30 which is mounted on a shaft 31, said shaft being journaled in bearings 32 which are mounted on the supports 33, a spring 34 serving to hold the blade in proper engagement with the plate, the plate is of course revoluble, a sprocket 35 being mounted on the end of the shaft 36, and is geared to a sprocket 37 which is mounted on the drive shaft 38 by means of a chain 39.

Spaced apart bearings 40 are provided on the upper cover plate 18 and a bevel gear 41 being mounted on said shaft, said gear meshing with and driving a similar gear 42 which is mounted on the vertical shaft 7, the shaft 38 being driven from a motor, (not shown) or any other suitable source of power. The R. P. M. of the discs is of course sufficient to throw the material with sufficient force to break the soft stone, clay balls, and other foreign matter, and while in the present instance I have shown but a two stage machine, it will be obvious that any required number of stages may be provided to suit the material being handled, and I do not deem it necessary to describe each stage in detail, as each stage is identical and the description of but one will suffice for all.

Under certain conditions it will be found necessary to use a spray in connection with the revoluble "strike" plate, the force with which the material strikes the plate will pound and jar, causing the bulk of the clay to drop off before it reaches the scraper, but any clay remaining on the disc will be loosened by jets of water forced from the spray pipe 43, which is connected to a suitable water supply, (not shown), said spray being directed against the back of the plate cleans the perforations therein and the scraper effectively removes all of the remainder, the force of the spray being regulated to suit.

In operation the material is fed to the machine through the feed spout 23 and onto the revolving disc 11, this throws the material outwardly through the opening 22 and against the strike plate 24, the gravel dropping into the down spout 28 and onto the lower disc 10, the distintegrated clay balls and other foreign matter being carried off through the clay chute 29. The material feeding downwardly to the disc 10 is again subjected to the same operation, further breaking up the clay and soft stone, the gravel drops into a down spout 38 and is spouted to a rewash screen, (not shown), or to any other desired location, the rewash screen removing all distintegrated soft stone particles, as well as any discoloration resulting from the powdering of said stone and clay balls.

It will be noted that liners are provided for all parts subjected to wear and abrasive action of the gravel, so that they can be readily removed and replaced, the parts are all of rugged construction, and the machine is simple and economical to build.

From the foregoing description it will be obvious that I have perfected a very simple, practical, and efficient disintegrating machine for disintegrating soft stone, clay ball, and other undesirable material in gravel.

What I claim is:—

1. A distintegrating machine comprising a frame, a drive shaft, a disc mounted thereon and revolved thereby, a stationary rim for said disc and provided with a discharge opening, a revoluble strike plate opposing said opening in spaced relation and disposed on an axis at right angles to the axis of said disc, and means for driving said shaft and plate.

2. A disintegrating machine comprising a frame, a vertically disposed drive shaft, a disc rigidly mounted thereon and revolved thereby, a disc rim secured to said frame and provided with a discharge opening, a revoluble strike plate opposing said opening in spaced relation, and means for simultaneously operating said shaft and plate.

3. A disintegrating machine comprising a frame, a vertically disposed drive shaft, a disc rigidly mounted thereon and revolved thereby, a stationary plate forming a cover for said disc and provided with a downwardly projecting rim having a discharge opening, said rim opposing in close proximity the marginal portion of one face of said disc, a revolving strike plate opposing in spaced relation said opening, and means for simultaneously driving said shaft and strike plate.

4. A disintegrating machine comprising a frame, a vertically disposed drive shaft, a disc rigidly mounted thereon, revolved thereby and provided on one face with arms radiating from the center thereof, a stationary cover plate, an annular member secured thereto, depending therefrom and having a discharge opening therein, said member providing a rim of the disc, a revolving strike plate adjacent said opening, and means for driving said shaft and strike plate.

5. A disintegrating machine comprising a frame, a vertically disposed drive shaft, a disc revolved thereby and provided with radiating arms on one face thereof, removable liners on said arms, a cover plate, a stationary rim forming member for said disc, said member surrounding the outer ends of said arms, said member secured and depending from said plate and provided with a material discharge opening, an inner liner on said member, a revoluble strike plate adjacent said discharge opening, and means for driving said disc and strike plate, the latter being disposed on an axis at right angles to the axis of the disc.

6. A disintegrating machine comprising a frame, a vertically disposed shaft, superposed spaced discs mounted thereon and simultaneously revolved thereby, superposed spaced stationary cover plates, rim forming members for said disc, said members being secured to and depending from said plates and each provided with a discharge opening, revoluble strike plates opposing in spaced relation said openings, means for feeding material to said discs, and means for cleaning the face of said strike plates.

7. A disintegrating machine comprising a frame, a vertically disposed drive shaft, superposed discs mounted on said shaft in spaced apart relation and operated thereby, cover plates for said discs, a rim secured to each cover and having a discharge opening, said rims depending from said cover plates opposing and extending in close proximity to one face of said discs, said rims being stationary, a revoluble strike plate adjacent each discharge opening, and a scraper for cleaning said plate as it is revolved, said plates being disposed on axes at right angles to the axes of said disc.

8. A disintegrating machine comprising a frame, a vertically disposed shaft, a disc mounted thereon and revolved thereby, a cover plate, a stationary rim surrounding said disc and provided with a discharge opening therein, said rim being secured to and depending from said cover plate, a revoluble strike plate opposing in spaced relation said opening, and means for directing a fluid spray against said strike plate, the latter

being disposed on an axis at right angles to the axis of said disc.

9. A disintegrating machine comprising a frame, a vertically disposed shaft, spaced apart discs mounted thereon, cover plates for said discs, rims secured to said plates and surrounding said discs, discharge openings in the disc, revoluble perforated strike plates adjacent said openings, means for driving said discs and strike plates, and means for directing a fluid spray against said plates.

10. A disintegrating machine comprising a main frame, a centrally disposed shaft, a disc mounted thereon, a cover plate, a rim secured thereto and surrounding said disc, a discharge opening in the rim, a revoluble perforated strike plate adjacent said opening, a scraper, means for directing a liquid spray against said plate, and means for driving said disc and plate.

11. In a disintegrating machine, a disc revolving on a vertical axis, an annular member arranged above the disc and forming a rim for the latter, a stationary cover plate for said member, the latter being fixed to and depending from the plate and provided with a material discharge opening, a plurality of radially disposed arms carried by the disc and surrounded by said member, a strike plate revolving upon a horizontal axis and arranged in opposed spaced relation to said opening, said strike plate extending above and below said disc, and means for simultaneously operating the strike plate and disc, said cover plate having means for directing the material to be acted upon to said disc.

12. In a disintegrating machine, a disc revolving on a vertical axis, an annular member arranged above the disc and forming a rim for the latter a stationary cover plate for said member, the latter being fixed to and depending from the plate and provided with a material discharge opening, a plurality of radially disposed arms carried by the disc and surrounded by said member, a strike plate revolving upon a horizontal axis and arranged in opposed spaced relation to said opening, said strike plate extending above and below said disc, and means for simultaneously operating the strike plate and disc, said cover plate having means for directing the material to be acted upon to said disc, said strike plate being formed throughout with perforations.

13. In a disintegrating machine, a disc revolving on a vertical axis, an annular member arranged above the disc and forming a rim for the latter, a stationary cover plate for said member, the latter being fixed to and depending from the plate and provided with a material discharge opening, a plurality of radially disposed arms carried by the disc and surrounded by said member, a strike plate revolving upon a horizontal axis and arranged in opposed spaced relation to said opening, said strike plate extending above and below said disc, means for simultaneously operating the strike plate and disc, said cover plate having means for directing the material to be acted upon to said disc, said strike plate being formed throughout with perforations, and a scraper operating against one face of the strike plate.

14. In a disintegrating machine, a disc revolving on a vertical axis, an annular member arranged above the disc and forming a rim for the latter, a stationary cover plate for said member, the latter being fixed to and depending from the plate and provided with a material discharge opening, a plurality of radially disposed arms carried by the disc and surrounded by said member, a strike plate revolving upon a horizontal axis and arranged in opposed spaced relation to said opening, said strike plate extending above and below said disc, means for simultaneously operating the strike plate and disc, said cover plate having means for directing the material to be acted upon to said disc, said strike plate being formed throughout with perforations, a scraper operating against one face of the strike plate, and means for directing a fluid spray against the other face of the strike plate.

MARTIN W. EDMAN.