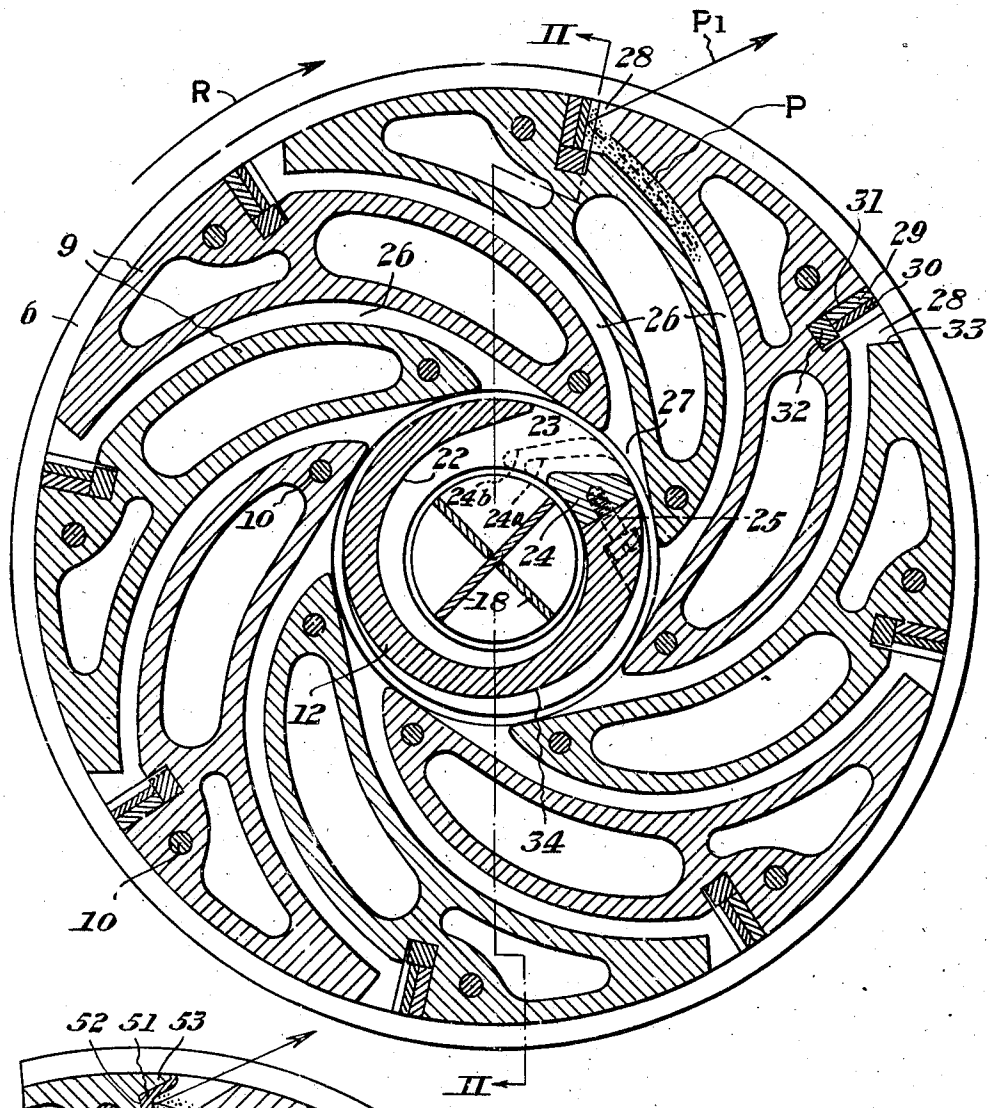
April 3, 1934. L. D. PEIK 1,953,566

BLASTING MACHINE

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Fig. 1.



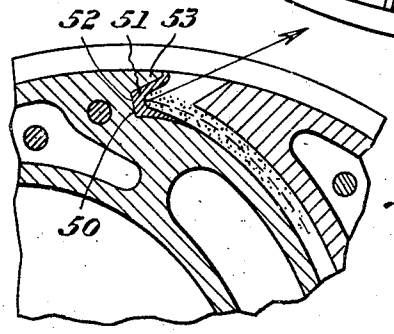


Fig. 6.

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BLASTING MACHINE

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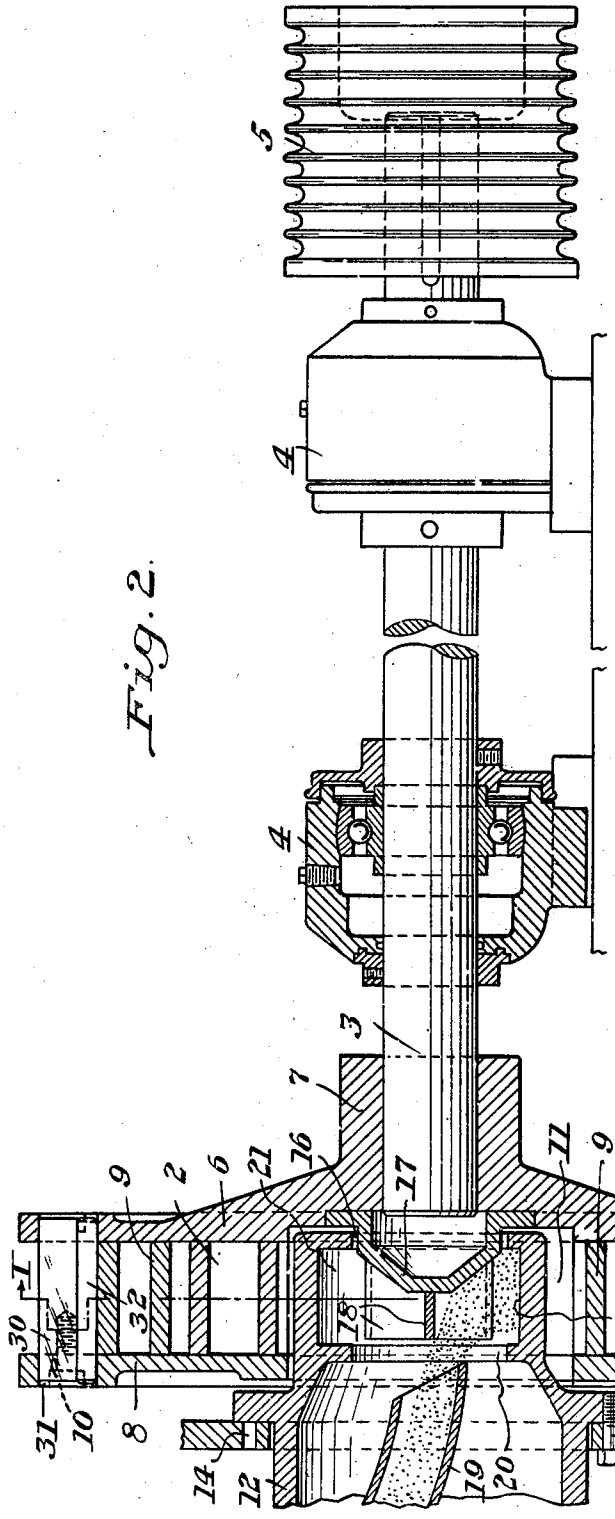


Fig. 2.

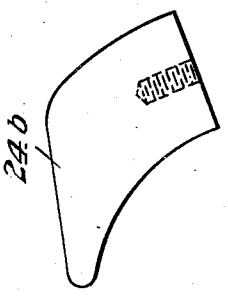


Fig. 5.

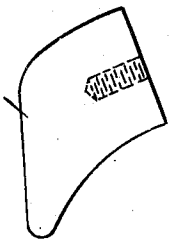


Fig. 4.

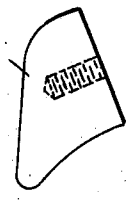


Fig. 3.

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1,953,566

BLASTING MACHINE

Louis D. Peik, Warren, Ohio, assignor to The Wean Engineering Company, Inc., Warren, Ohio, a corporation of Ohio

Application January 24, 1934, Serial No. 708,118

17 Claims. (Cl. 51—9)

This invention relates to blasting machines of the centrifugal type and is adapted for the projecting of abradant particles such as sand, shot or other grits. My machine is characterized by improved results and particularly by its ability to deliver the abradant around a selected portion only of the periphery. Generally speaking, centrifugal blasting machines discharge with greater or less uniformity all the way around the periphery, and since the normal way of handling material to be treated requires that it lie to one side only of the centrifugal wheel, it becomes necessary to shroud or shield the remaining portion of such heads. This procedure is bad principally because the shroud is itself rapidly worn away and the abradant is rapidly deteriorated. It is no exaggeration to state that in using centrifugal heads of ordinary type from half to three-quarters of the discharged abradant does not reach the article to be blasted. My improved machine has directional properties; that is to say, it discharges abradant around a portion only of the periphery and the zone of discharge may be nicely controlled so that it is possible to project the blast over a desired limited zone.

I provide a rotatable head having a central opening with a passage or passages extending from such opening to the periphery of the wheel, which passages are preferably spirals extending outwardly or rearwardly with respect to the direction of rotation. Within the central opening I place a normally stationary container, which container has a passage of peripheral length through which blast particles may be fed from the container to the passage or passages in the head. I employ an impeller within the container and feed blast particles to such impeller, whereby uniform feeding of the blast particles to the rotatable head is obtained. Since the feeding of blast particles from the container to the rotatable head takes place only over a limited range, the discharge is correspondingly limited. I make provision for adjusting the orientation of the container so that the orientation of the discharge zone may be likewise varied, and I also provide for adjusting the peripheral length of the opening through which the blast particles are supplied so that the annular length of the discharge zone may be likewise controlled.

I have found that in order to get the best results it is highly desirable to use passages of generally spiral form in the head, which passages serve to feed the particles at rapidly increasing velocity toward the periphery of the wheel. I there provide discharge or impact surfaces against which the particles strike and from which they rebound to be discharged from the head. This arrangement gives a nicety of control which is ordinarily very difficult if not impossible to obtain and insures highly efficient blasting.

In the accompanying drawings illustrating a present preferred embodiment of the invention,

Figure 1 is a section in the plane of the head taken on the line I—I of Figure 2;

Figure 2 is a transverse section taken on the line II—II of Figure 1;

Figures 3, 4 and 5 are views showing various sizes of filler blocks which may be employed for the purpose of adjusting the peripheral length of the opening in the central feeding container; and

Figure 6 is a view corresponding to a portion of Figure 1 but showing a modification.

Referring first to Figures 1 and 2, the head comprises a wheel, indicated generally by the reference character 2, mounted on a shaft 3 which is supported in bearings 4 and carries a grooved pulley 5 for driving from a suitable motor. The wheel 2 comprises a disc 6 having a hub 7, whereby it is mounted on the shaft 3, a ring 8 concentric with the disc 6 and interposed segments 9 forming the discharge passages for the abradant. The wheel is assembled by means of screws 10.

The wheel has a central cylindrical opening 11 and a stationary member 12, held on a ring-like support 13, extends into this opening. The support 13 is provided with slots 14 to accommodate bolts 15 so that by loosening the bolts the member 12 can be rotatably adjusted, thereby changing its orientation. The innermost end of the member 12 has an opening 16 through which there projects an impeller 17 carried by the disc 6. The impeller 17 is provided with radial blades 18 which serve to feed abradant particles to the wheel. The abradant is supplied in the first instance through a tube 19 and discharged through a central opening 20 in the member 12 into an impeller chamber 21. This chamber has a peripheral surface 22 which is generally in the form of an involute spiral. The chamber has a peripheral outlet 23, one face of which is formed by an extension of the surface 22 and the other of which is formed by a filler block 24 held in place by screws 25. The peripheral length of the opening 23 may be varied by using filler blocks of different sizes as indicated at 24*a* and 24*b* in Figures 1, 4 and 5. The central container with its impeller blades 18 serves to discharge the abradant material at a uniform rate to the wheel, and I have found that the use of an involute chamber, a straight-bladed impeller, means for varying the orientation of the container outlet, and means for varying the peripheral length of such outlet are all important if the best results are to be obtained. The direction of rotation of the head is indicated by an arrow R in Figure 1, and it will be observed that the discharge opening for the central container extends forwardly and out-

wardly with respect to such direction of rotation.

The abradant which is fed through the passage 23 is received by spiral passages 26 constituting the spaces between adjacent wheel segments 9. These passages have flared inner ends 27 for more effective pick-up of the abradant. The passages extend outwardly and rearwardly with respect to the direction of rotation and terminate adjacent the periphery of the wheel in radial extending passages 28. The rearward faces of the passages 28 (considering the direction of rotation) are provided with impact plates 29 having abrasion resistant impact surfaces 30. Such surfaces may be an exceedingly hard material such as tungsten carbide or they may be of some material such as rubber. These impact plates are slipped into position through openings 31 in the side faces of the wheel 6 and the disc 8 and are held in place by keys 32 which are slightly tapered and are driven into place.

When abradant reaches the inner end of a passage 26 it is moved outwardly as the wheel rotates at high velocity and the velocity of each particle is raised to an increasingly higher figure as it approaches the periphery of the wheel. The impact plate 29 lies in the path of the abradant and the abradant strikes the face of such plate and is thrown off at high velocity. I have indicated by an arrow P the path of a particle through one of the passages 26 and by an arrow P—1 the path of such particle after it strikes the impact plate. It will be noted that the forward faces 33 of the radial passages 28 are extending forwardly and outwardly so as to provide clearance for the rebounding particles. The radially extending openings 28 should be at least as wide as the passages 26.

It will be noted from Figure 1 that the outer surface of the central container is not truly cylindrical but is relieved for a distance forwardly (considering the direction of rotation of the wheel) of the opening 23. This is indicated at 34. I have found that the provision of a space in this manner materially aids in the feeding of abradant to the wheel and prevents choking.

Figure 6 shows a modified construction wherein the impact surface, instead of being radial as in Figure 1, is in the form of a pocket 50. This pocket has a lining 51 of a suitable material such as rubber or tungsten carbide. The pocket is formed by providing a radially extending surface 52 and an overhung forwardly extending lip 53. It is my belief that with this form of impact surface some particles are trapped in the pocket as soon as the feeding of abradant through the head commences, and that while there is probably a more or less constant replacement of the trapped particles, there will remain at all times a sufficient number of them in the pocket to reduce the amount of wear on the impact surface.

My improved wheel discharges around a portion only of its periphery. The orientation of the discharge zone may be readily controlled by adjusting the orientation of the discharge passage 23, and the size of the zone may be readily controlled by adjusting the peripheral length of such passage. The edges of the zone are quite sharply defined so that surface blasting may be carried out accurately and successfully over such zone and maximum efficiency obtained from the abradant. It is unnecessary to shroud the wheel by impact surfaces for receiving the major portion of the abradant as is the case with most devices of this character; and while, as a matter of plant cleanliness, the head will generally be shrouded, there is substantially no discharge of particles outside the controlled zone.

The speed and character of the surface blasting effect may be varied by changing the speed of the wheel and by the size and character of the abradant employed. My improved head will operate successfully with any of the known abradants in particle form, such as sand, shot or steel grit.

While I have illustrated and described preferred embodiments of my invention, it will be understood that the same is not limited thereto but may be otherwise embodied and practiced within the scope of the following claims.

I claim:

1. A blasting machine comprising a rotatable head having a spiral passage therein extending outwardly and rearwardly with respect to the direction of rotation of the head and terminating adjacent the periphery of the head, means for supplying blast particles to the passage at a point remote from the periphery of the head, the head having a discharge surface adjacent the end of the spiral passage inclined to the direction of travel of particles through the passage and adapted to make contact with the particles supplied through the passage to change the direction thereof and effect discharge of the same from the head.

2. A blasting machine comprising a rotatable head having a spiral passage therein extending outwardly and rearwardly with respect to the direction of rotation of the head and terminating adjacent the periphery of the head, means for supplying blast particles to the passage at a point remote from the periphery of the head, the head having a discharge surface adjacent the end of the spiral passage inclined to the direction of travel of particles through the passage and adapted to make contact with the particles supplied through the passage to change the direction thereof and effect discharge of the same from the head, the spiral passage being of such limited length that the last-mentioned surface lies in the normal path of substantially all the particles fed through the passage.

3. A blasting machine comprising a rotatable head having a spiral passage therein extending outwardly and rearwardly with respect to the direction of rotation of the head and terminating adjacent the periphery of the head, means for supplying blast particles to the passage at a point remote from the periphery of the head, the head having a radially extending discharge surface adjacent the end of the spiral passage inclined to the direction of travel of particles through the passage and adapted to make contact with the particles supplied through the passage to change the direction thereof and effect discharge of the same from the head.

4. A blasting machine comprising a rotatable head having a spiral passage therein extending outwardly and rearwardly with respect to the direction of rotation of the head and terminating adjacent the periphery of the head, means for supplying blast particles to the passage at a point remote from the periphery of the head, and an impact plate adjacent the periphery of the head lying in the normal path of travel of particles supplied through the passage, the head having an opening in its periphery through which particles deflected by the impact plate may be discharged from the head.

5. A blasting machine comprising a rotatable head having a spiral passage therein extending

outwardly and rearwardly with respect to the direction of rotation of the head and terminating adjacent the periphery of the head, means for supplying blast particles to the passage at a point remote from the periphery of the head and a discharge passage adjacent the periphery of the head making connection with the spiral passage and having an impact surface in the normal path of particles fed through the spiral passage.

6. A blasting machine comprising a rotatable head having a spiral passage therein extending outwardly and rearwardly with respect to the direction of rotation of the head and terminating adjacent the periphery of the head, means for supplying blast particles to the passage at a point remote from the periphery of the head, and a discharge passage adjacent the periphery of the head making connection with the spiral passage and having an impact surface in the normal path of particles fed through the spiral passage, the discharge passage flaring outwardly.

7. A blasting machine comprising a rotatable head having a spiral passage therein extending outwardly and rearwardly with respect to the direction of rotation of the head and terminating adjacent the periphery of the head, means for supplying blast particles to the passage at a point remote from the periphery of the head, and a discharge passage adjacent the periphery of the head making connection with the spiral passage and having an impact surface in the normal path of particles fed through the spiral passage, the discharge passage being at least as wide as the spiral passage.

8. A blasting machine comprising a rotatable head having a central opening, a passage extending from the central opening to the periphery of the head, a normally stationary container within the central opening, said container having a passage of limited peripheral length through which blast particles may be fed from the container to the passage, and means for supplying blast particles to the container.

9. A blasting machine comprising a rotatable head having a central opening, a passage extending from the central opening to the periphery of the head, a normally stationary container within the central opening, said container having a passage of limited peripheral length through which blast particles may be fed from the container to the passage, and means for supplying blast particles to the container, the orientation of the passage in the container being adjustable.

10. A blasting machine comprising a rotatable head having a central opening, a passage extending from the central opening to the periphery of the head, a normally stationary container within the central opening, said container having a passage of limited peripheral length through which blast particles may be fed from the container to the passage, and means for supplying blast particles to the container, the peripheral length of the passage in the container being adjustable.

11. A blasting machine comprising a rotatable head having a central opening, a passage extending from the opening to the periphery of the head, a normally stationary container within the central opening, said container having a passage of limited peripheral length through which blast particles may be fed from the container to the passage in the head, a filler block defining a portion of the passage in the container, and means for supplying blast particles to the container.

12. A blasting machine comprising a rotatable head having a central opening, a passage extending from the central opening to the periphery of the wheel, a normally stationary container within the central opening, said container having a passage extending outwardly and forwardly with respect to the direction of rotation through which blast particles may be fed from the container to the head, and means for supplying blast particles to the container.

13. A blasting machine comprising a rotatable head having a central opening, a passage extending outwardly and rearwardly with respect to the direction of rotation, a normally stationary container within the central opening, said container having a passage extending forwardly and outwardly with respect to the direction of rotation of the head and through which passage blast particles may be fed from the container to the passage in the head, and means for supplying blast particles to the container.

14. A blasting machine comprising a rotatable head having a central opening, a passage extending from such opening to the periphery of the head, a normally stationary container within the central opening, said container having an inner peripheral surface which is a forwardly and outwardly extending spiral with respect to the direction of rotation of the head, the container having a passage of limited peripheral length through which blast particles may be fed from the container to the passage in the head, and means for supplying blast particles to the container.

15. A blasting machine comprising a rotatable head having a central opening, a passage extending from such central opening to the periphery of the head, a normally stationary container within the central opening, said container having a passage of limited peripheral length through which blast particles may be fed from the container to the passage in the head, means for supplying blast particles to the container, and an impeller in the container for feeding such particles through the passage in the container.

16. A blasting machine comprising a rotatable head having a central opening, a passage extending from such central opening to the periphery of the head, a normally stationary container within the central opening, said container having a passage of limited peripheral length through which blast particles may be fed from the container to the passage in the head, means for supplying blast particles to the container, and an impeller in the container for feeding such particles through the passage in the container, the impeller having radial blades.

17. A blasting machine comprising a rotatable head having a central opening of circular cross section, a passage extending from such central opening to the periphery of the head, a normally stationary container within the central opening, the container having a passage of limited peripheral length through which blast particles may be fed from the container to the passage in the head, the container being generally circular in external cross section but having such surface relieved forwardly of the container passage, and means for supplying blast particles to the container.

LOUIS D. PEIK.