

1

2

3,242,616

**MAGNETIC WEAR PLATES FOR ABRASIVE
BLASTING CHAMBERS**

John V. Haider, Pittsburgh, Pa., assignor to The Pangborn Corporation, Hagerstown, Md., a corporation of Delaware

Filed Sept. 4, 1963, Ser. No. 306,503

1 Claim. (Cl. 51-9)

The present invention relates to abrasive blasting chambers having their inner surfaces protected with magnetic wear plates.

One of the common problems encountered in abrasive blasting assemblies wherein a rotating wheel having abrasive throwing vanes mounted thereon for projecting a stream of abrasive against articles to be descaled, cleaned or otherwise treated is that of ricocheting abrasive. This ricocheting abrasive rebounds into the abrasive blasting chamber, strikes the walls thereof and then falls back into the blast stream and the surrounding area which causes severe difficulties since these ricocheting particles are on a different trajectory than that of the controlled abrasive stream being emitted from the wheel.

Another common problem is that the ricocheting abrasive erodes the chamber walls as it strikes the walls, thus causing premature failure in the walls. A number of protective means have been designed to protect the chamber walls from ricocheting abrasive. However, no satisfactory plan has been developed to prevent the ricocheting abrasive from rebounding back into the blast pattern or surrounding area after it ricochets from the inner walls of the chamber.

In addition, the wear protecting plates themselves are subject to erosion by the ricocheting abrasive and, therefore, must be replaced frequently.

It is, therefore, one object of the present invention to provide a novel and improved abrasive blasting chamber wherein the inner walls are protected from the harmful effects of ricocheting abrasive and also wherein the ricocheting abrasive may be trapped and held so that it will not further interfere with the blasting operation.

Another object of the invention is to provide a new and novel abrasive blasting chamber wherein the inner surfaces thereof are protected with magnetic wear plates to both protect the chamber walls from the harmful effects of ricocheting abrasive and to trap and hold the ricocheting abrasive.

Still another object is to provide a new and novel abrasive blasting chamber wherein the magnetic wear plates are actually protected from wear by a layer of abrasive clinging to the plates.

Other objects and advantages of the present invention will become apparent from the study of the following description and drawing wherein:

FIGURE 1 is a detail showing one wall of the abrasive chamber having the magnetic wear plate attached thereto and showing in addition one pattern or path which the ricocheting abrasive assumes after it strikes the article being treated;

FIGURE 2 gives a top view of an abrasive treating chamber showing the abrasive throwing wheel housing and the electric or other power source for driving the rotatable wheel;

FIGURE 3 is an end view of the apparatus of FIGURE 2 and further shows another path which ricocheting abrasive may assume upon rebounding from the article being treated; and

FIGURE 4 is a side view of the apparatus of FIGURES 2 and 3 and shows in greater detail the numerous paths or patterns which are assumed by ricocheting abrasive as it rebounds from the articles being treated.

Referring now to the drawings, the abrasive blasting cabinet 1 is shown in FIGURES 2 through 4. On top of the cabinet 1 is supported the rotatable abrasive blasting wheel 3 shown in the dotted line in FIGURE 4. The wheel is enclosed or covered by housing 5 and abrasive media is supplied to wheel through supply or feed funnel 7. The rotatable abrasive throwing wheel is driven by a suitable belt 9 connected with electric motor or other drive power source 11.

As shown better in FIGURES 3 and 4, the lower portion of the abrasive wheel 3 extends into the abrasive treating chamber 1 whereby a stream 13 of abrasive is projected against work articles 15 to be cleaned, descaled or otherwise treated.

As seen in FIGURES 1, 3 and 4, the abrasive 13 ricochets from the articles 15 in various and sundry paths to strike the walls of the abrasive blasting chamber, particularly the upper wall.

FIGURE 1 shows in detail the magnetic wear plate 20 which is connected with the inner surface of the wall of treating chamber 1. As further shown in FIGURE 1, there is seen the trapped ricocheting paramagnetic abrasive media 13 clinging in layers to the magnetic wear plate 20. The abrasive media builds up along the inner surface of the wall in chamber 1 to form a protective layer thereover whereby additional ricocheting abrasive will not harm the inner surface of the walls of the magnetic plate 20 or the treating chamber walls.

The composition or makeup of the magnetic plate 20 can be of a high carbon steel which has the ability to develop and maintain a state of magnetism. The plate 20 is used as a solid one-piece plate with magnetic poles induced by electromagnetized bars of the magnetizing device as diagrammatically and generally shown in FIGURE 1. On the other hand, permanent magnet type wear plates can also be used with most satisfactory results. For instance, Alnico type magnets can be used.

On the other hand, the wear plate 20 may be formed of a resilient material 22 as shown in FIGURE 1, but used without electromagnetic exciting, which material has permanent magnet particles 24 homogeneously dispersed throughout the resilient material. This type of wear plate would permit further absorption of the impingement impact energy of the abrasive with even a lower breakdown rate of the abrasive layer wear surface which builds up on the plate.

Should the layer of abrasive become too great or too extensive on the wear plates, a simple commercial demagnetizer can be installed at some point in the transfer of the shot to prevent excessive magnetism being built up in the abrasive.

Since most of the abrasive used today is of a ferrous nature which has paramagnetic properties, almost any type of commercial abrasive shot can be used with the magnetic wear plates.

The advantages of the invention are that the attracted layer of abrasive material protects the surface of the wear plates as well as the surface of the abrasive chamber from erosion, thus making replacement of the wear plates unnecessary or at least very infrequent.

Breakdown of the abrasive particle layer surface is very low. The irregular nature of the abrasive particles used and the fact that many voids exist in the abrasive layer causes the absorption of impact energy from the impinging ricocheting abrasive particles to be very high, resulting in low erosion at the wear surface.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is, therefore, to be understood that within the scope of the appended claim the invention may be practiced otherwise than as specifically described.

3

What is claimed is:

An abrasive blasting chamber assembly comprising a walled abrasive blasting chamber having walls with inner surfaces, a rotatable abrasive blasting wheel supported on the exterior of the blasting chamber, an opening in said chamber through which abrasive passes from the rotatable abrasive blasting wheel into the chamber against work articles supported in said chamber, wear plates of resilient material affixed to the inner surfaces of the walls of said walled blasting chamber, and permanent magnet particles homogeneously dispersed throughout the resilient material.

5

10

4

References Cited by the Examiner

UNITED STATES PATENTS

2,423,287	7/1947	Beiser	-----	51-9
2,442,678	6/1948	Dybiec	-----	51-9
2,887,826	5/1959	Schultz	-----	51-9

FOREIGN PATENTS

839,225	3/1939	France.
941,184	11/1963	Great Britain.

LESTER M. SWINGLE, *Primary Examiner.*

March 29, 1966

J. V. HAIDER

3,242,616

MAGNETIC WEAR PLATES FOR ABRASIVE BLASTING CHAMBERS

Filed Sept. 4, 1963

Fig. 1.

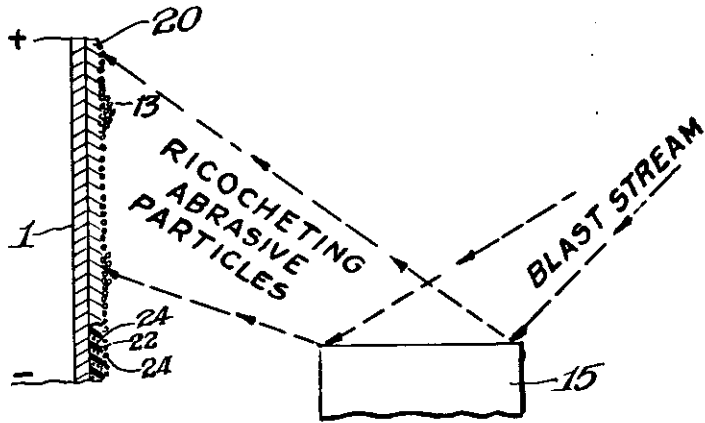


Fig. 2.

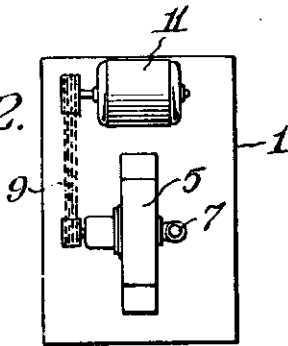


Fig. 3.

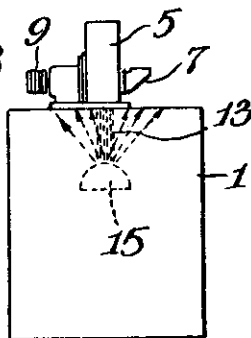
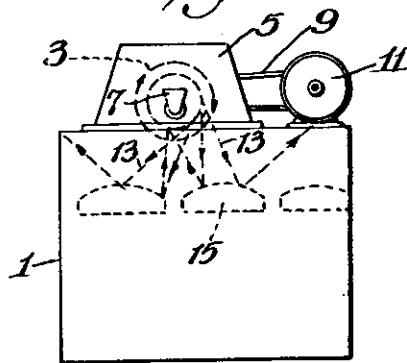


Fig. 4.



INVENTOR
JOHN V. HAIDER

BY *Connolly and Hutz*
ATTORNEYS