

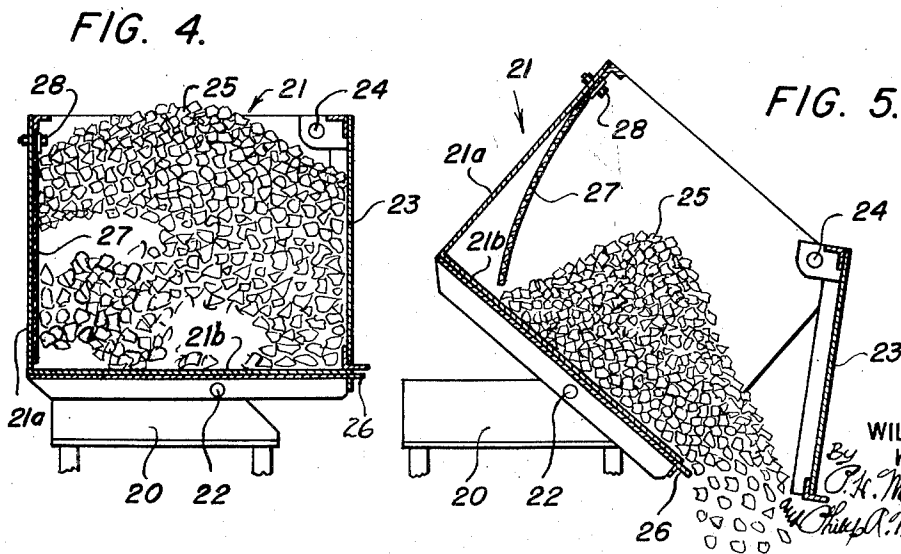
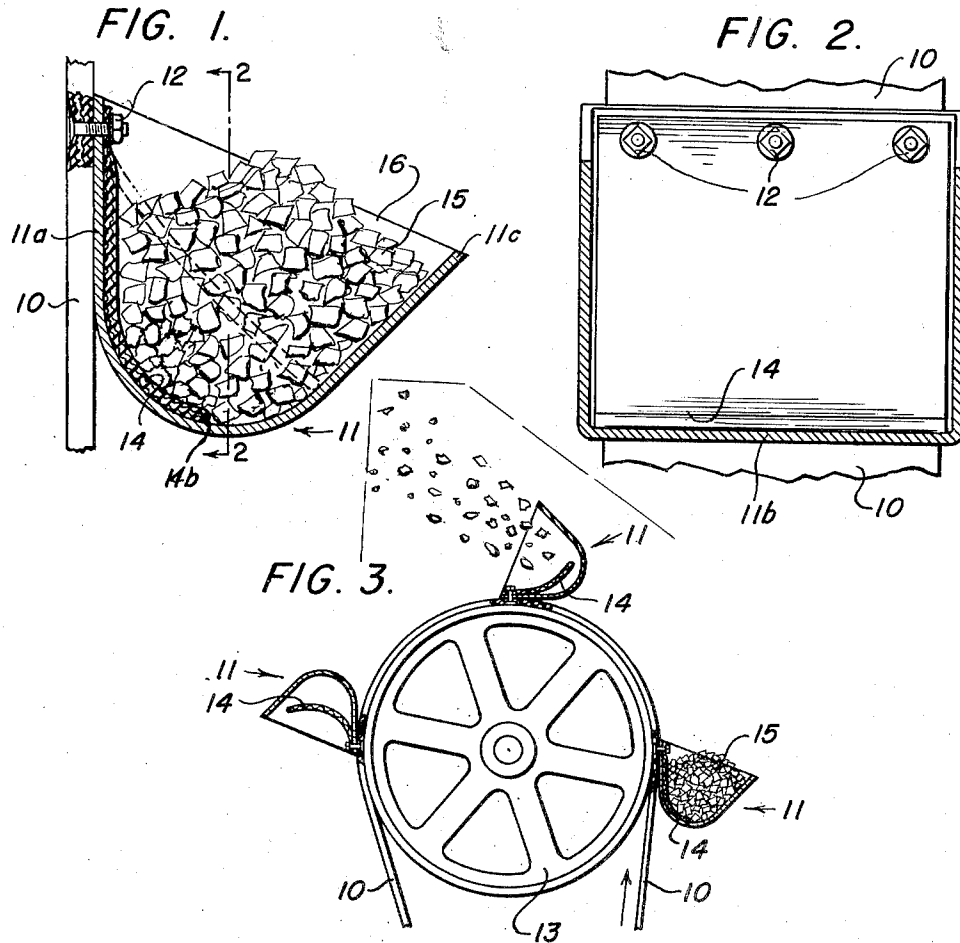
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ELEVATOR BUCKET WITH SUCTION BARRIER

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ELEVATOR BUCKET WITH SUCTION
BARRIER

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2 Claims. (Cl. 198—152)

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This invention relates to receptacles or containers with suction barriers, arranged for receiving and dumping various materials, especially rock materials, such as broken metalliferous ores having a varying content of finely divided particles and moisture. In particular, the invention relates to such receptacles or containers as the buckets of bucket elevators and the bodies of ore cars which are tipped for the discharge of contents.

Wet material with a content of fine particles, when loaded into receptacles, packs against the inner surfaces thereof and tends to produce a considerable suction between the material and the inner surfaces of the receptacles. In dumping or emptying the receptacles, the suction effect ordinarily causes some of the packed material to stick to such inner surfaces, and after repeated dumpings to build up in the receptacle, appreciably reducing its carrying capacity and impairing its usefulness. This necessitates shut-downs for cleaning.

Pursuant to the present invention, I provide a construction which effectively eliminates the said difficulties.

Accordingly, a primary object of the invention is to prevent the accumulation of matter along the inside surfaces of dump receptacles, thus insuring continuing availability of substantially the complete carrying capacities of such receptacles regardless of the character of material handled thereby.

It is an object to accomplish the above in a simple and relatively inexpensive manner.

An outstanding feature of the invention is the provision of a suction barrier, in the form, for example, of a flap of sheet material secured to an upper portion of the receptacle opposite the dump side thereof and hanging freely downwardly to cover such surfaces of the receptacles against which fine, wet material ordinarily sticks. The barrier flap automatically swings away from the surface to which it is adjacent, during a dumping operation, to aid in freely discharging material from the receptacle.

The barrier flap is advantageously made of an abrasive-resistant sheet material, such as ordinary rubber chute lining or belting, so that, when the dumping operation is completed, the barrier flap again automatically resumes its normal position.

Additional objects and features of the invention will become apparent as the description proceeds with respect to the presently preferred forms thereof illustrated by way of example in the accompanying drawing.

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In the drawing:

Fig. 1 represents a vertical cross section taken through an elevator bucket and showing a suction barrier applied in accordance with the invention;

Fig. 2, a vertical section taken on the line 2—2 of Fig. 1;

Fig. 3, a fragmentary view, drawn to a reduced scale, of a bucket elevator showing several buckets in section as they approach, round and leave the elevator head pulley, centrifugal force being active in the process of emptying a bucket;

Fig. 4, a vertical cross-section taken through one type of ore dump-car to which a suction barrier is applied in accordance with the invention, and,

Fig. 5, a similar vertical section illustrating one pattern of the car-body and barrier flap during the process of dumping a load by gravity.

Referring now to the drawing: the embodiment of Figs. 1, 2 and 3, wherein the invention is incorporated in the buckets of a bucket elevator, comprises the usual elevator construction, including a belt 10, Fig. 3, to which elevator buckets 11 are attached at conveniently spaced intervals, as by means of bolts 12. The belt runs over spaced head and boot pulleys in conventional fashion, only the upper or head pulley 13 being here illustrated. As shown, the pulley 13 turns in a counterclockwise direction so that the buckets 11 pick up their respective loads on the up travel, indicated by the upwardly directed arrow, discharge their loads by centrifugal force as they round the pulley 13, and return to the bottom of the elevator in inverted position at the opposite side.

In accordance with the invention, there is incorporated with each elevator bucket 11, a suction barrier flap 14 which latter is secured to the upper part of the bucket and extends downwardly against the back of the bucket. The fastening of the flap 14 is along the line of bolts 12, so that the lower portion is free to move away from the back 14a as indicated, for illustration, by broken lines 14a in Fig. 1. As illustrated, the flap extends down to the deepest point in the bucket, and terminates at approximately that point. This not only insures against undesirable suction, which ordinarily prevents complete discharge of muck and the like from the buckets, but avoids undesirable interference with normal discharge characteristics of the buckets.

Ordinarily, the same bolts that secure a bucket to an elevator belt can also serve to fasten the barrier flap. As hereinbefore stated, the

primary purpose of the flap 14 is to function as a barrier that prevents the natural suction effect of wet material from causing such material to stick to an inner surface of a dump receptacle, thereby eliminating the building up of an accumulation of the material against such surface. For this purpose the barrier should cover as completely as possible the surface to be protected against the suction effect.

As here illustrated, the barrier flap 14 extends across practically the entire inner surface of the back wall 11a of the bucket, leaving however, sufficient clearance at 14a between the edges of the barrier flap and the side walls 14b of the bucket, so there is no binding between the two. This leaves the lower edge portion 14c of the barrier flap free to float back and forth. At the same time, the floating edge portion 14c is brought down far enough in the bucket, so that in loading, the tendency is to keep particles from lodging behind the flap.

When the bucket is emptying by the action of centrifugal force as aforesaid, the barrier flap is relieved and so springs away from the corresponding wall surface, somewhat after the manner indicated at the top of Fig. 3. Thus, the material at no time is given any chance to stick against the back of the bucket. Furthermore, the velocity of the discharging material along other inside surfaces of the bucket, cleans and polishes those surfaces instead of having any tendency to stick and pack.

It is preferred that the barrier flap be made of sheet rubber material or light rubber belting having a certain degree of resiliency. Conventional chute lining as employed in the mining and milling art has been found satisfactory in thicknesses determined by the size of the receptacle and nature of its use.

The embodiment of Figs. 4 and 5 shows the invention incorporated in an ore dump-car, comprising a supporting frame 20 to which a dump body 21 is pivotally secured, as at 22, for side-wise tilting movement. The ore car, including its dump body 21, is of conventional construction, one side of the body being arranged as a dump door 23 for swinging outwardly on the pivot axis 24 to dump car contents 25 over the discharge lip 26 when the body is tilted into the dump position of Fig. 5.

Similarly to the case of the previous embodiment, a barrier flap, here designated 27, is secured to an upper portion of the car body 21 so as to hang adjacent the inner surface of the wall against which matter ordinarily adheres and builds up accumulations.

The flap 27 is here secured, for illustration, by means of a line of bolts 28, to the upper inner margin of that side wall 21a of the car body which lies opposite the dump door 23, and hangs freely downwardly to comprehend approximately the entire inner surface of such side wall 21a. The line of securement of the flap 27 is approximately parallel with the discharge lip 26, and the flap extends approximately to, but substantially no farther than, the deepest part of the receptacle.

From the foregoing description it will be clear that the barrier flap does not push material out of a receptacle, but does allow the material to let loose of the receptacle, so, as in the case of an elevator bucket, the material is thrown out because of centrifugal force, and, as in the case of an ore car, the material is thrown out because of the force of gravity.

It is to be understood that the barrier flap may normally hang against a surface when a receptacle is emptied to protect against the suction of material loaded into the receptacle, or the barrier flap may normally hang somewhat away from such a surface when the receptacle is empty; the operative result is the same in both cases. That is to say, material loaded into the receptacle contacts the barrier flap, but in no way contacts the surface against which the barrier flap bears. Thus, the ordinary suction effect is never against a receptacle surface so protected, since the barrier flap forms a sheet of separation and protection.

Whereas this invention is here illustrated and described with respect to certain presently preferred forms thereof, it should be understood that various changes may be made in such preferred forms and various other forms may be constructed on the basis of the teachings hereof by those skilled in the art, without departing from the scope of the following claims.

I claim:

1. In a bucket elevator equipped with a plurality of spaced buckets, adapted to discharge material centrifugally, suction barrier flaps in the form of respective sheets of flexible resilient material substantially covering the back inner surfaces of said bucket, and extending approximately to but substantially no farther than the deepest point of said buckets; and fastenings securing the respective flaps along their upper edge portions to the upper back edge portions of said buckets.

2. The combination recited in claim 1, wherein the said sheets of flexible resilient material are of the nature of rubber chute lining.

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