

Sept. 17, 1963

H. W. ROCKWELL

3,103,752

CUTTING BLADE FOR EXCAVATOR

Filed April 10, 1961

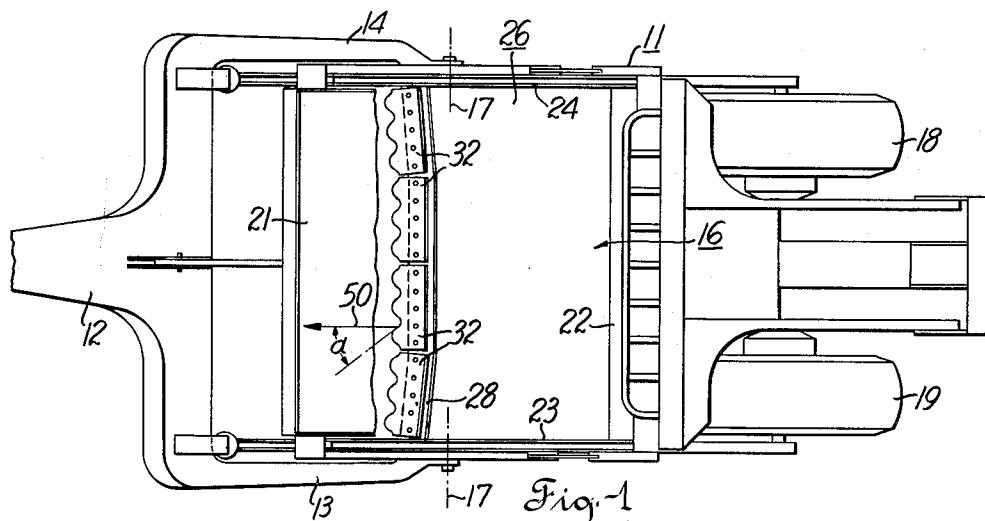
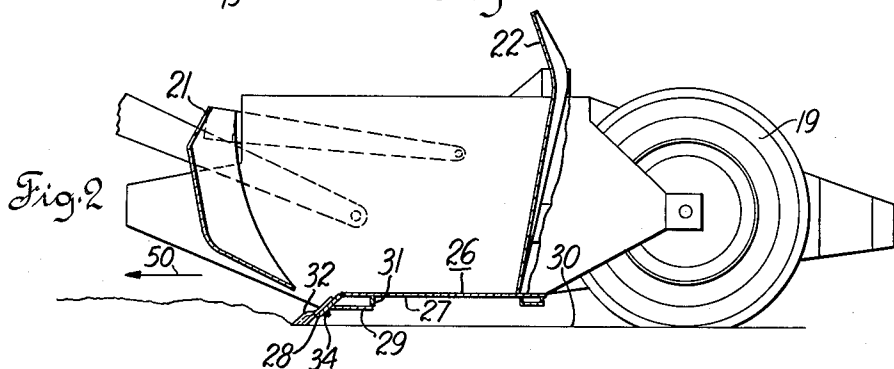
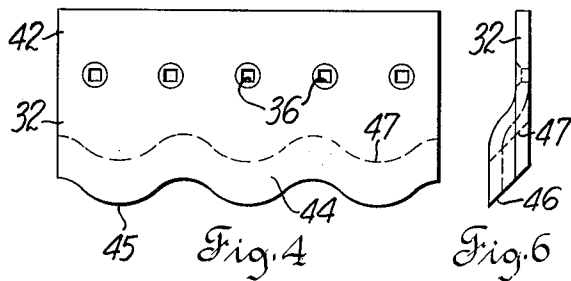
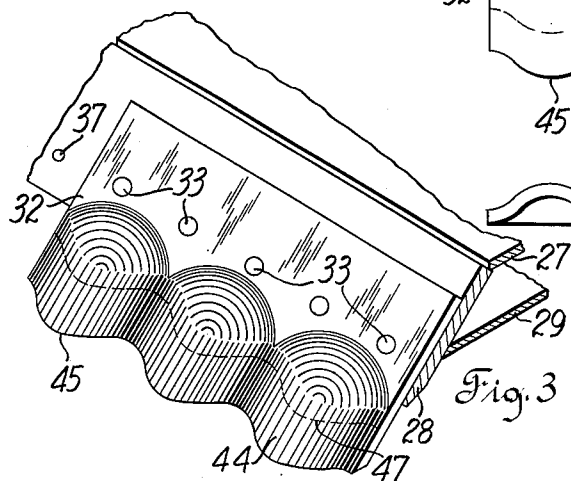


Fig. 5

Inventor
Harvey W. Rockwell
By Charles E. Schuch
Attorney

1

3,103,752

CUTTING BLADE FOR EXCAVATOR

Harvey W. Rockwell, Cedar Rapids, Iowa, assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Apr. 10, 1961, Ser. No. 101,876

1 Claim. (Cl. 37-141)

This invention relates to a cutting blade for an excavator and particularly to a cutting blade having an improved shearing action.

Heretofore it has been suggested that teeth be installed on the cutting edge of excavating machinery such as scrapers to improve the cutting action of the excavator. Such teeth are separate items which are detachably installed on the scraper with resulting additional expense to the user. The special digging teeth have facilitated excavating certain types of earth, however, it is desired to provide a cutting blade with improved shearing action which can be standard equipment and not be as costly to provide as a standard blade and detachable teeth. Heretofore, the straight blades which have been used in scrapers have required considerable power to shear the material being excavated, particularly when packed sand or clay is being excavated. It is an object of this invention to provide a blade which will give a slicing action in the process of shearing the material being excavated. Also it is an object of this invention to provide a blade that is self-sharpening.

It is a further object of this invention to provide a blade for an excavator which is not a special attachment such as a digging tooth, but rather is suitable for use as the standard blade for the excavator.

It is a further object of this invention to provide a blade of the hereinbefore mentioned character which is self-sharpening and which maintains its ability to produce a slicing action even when it has worn to a considerable extent.

It is a further object of this invention to provide a blade for a bowl type earth mover which breaks up the material being excavated thereby reducing the power required for loading and obtaining improved loading action in filling the bowl.

These and other objects of this invention will be apparent when the following description is read in conjunction with the drawings in which:

FIG. 1 is a top view of a scraper embodying this invention;

FIG. 2 is a side view of the scraper shown in FIG. 1 with a portion of the scraper broken away to show the attachment of the blade thereto;

FIG. 3 is a perspective view of the cutting blade attached to the scraper;

FIG. 4 is a top view of a blade per se;

FIG. 5 is a front view of the blade shown in FIG. 4; and

FIG. 6 is an end view of the blade shown in FIG. 4.

Referring to FIGS. 1 and 2 a carry type scraper is illustrated. The scraper 11 includes a yoke 12 having legs 13, 14 pivotally secured to a bowl 16 on a transverse pivot axis 17. The rear end of the bowl 16 is supported by a pair of wheels 18, 19. An apron 21 and ejector 22 are provided on the bowl to operate in a conventional manner. The ejector 22 is mounted between a pair of side walls 23, 24 and above a bottom 26. The bottom 26 includes a longitudinal plate 27 and a box construction at the forward end thereof for providing a blade supporting structure. The box construction includes a transverse plate 28 welded to plate 27 and disposed at an approximate 45° angle thereto and to the ground surface 30. The box section is completed by a horizontal plate 29

2

welded to plate 28 and a vertical plate 31 which is welded to plates 29 and 27 to give a rigid construction.

My novel blade 32 is secured to plate 28 by a plurality of bolts 33 and nuts 34. Blade 32 is disposed at an acute vertical angle of inclination to the direction of excavating movement 50. As illustrated in FIGS. 3 and 4, taper headed bolts 33 extend through square openings 36 in blade 32 and holes 37 in plate 28. In the illustrated embodiment of this invention four blades are utilized for the cutting bottom portion of the wheeled scraper. These blades are disposed substantially at a right horizontal angle to the direction of movement of the excavator during excavation. By using sectional portions of the blade, as illustrated, the forward edge of the bottom of the scraper may be laid out on a slight curve without requiring bending of the blade segments 32. Also the provision of several blade segments rather than a single blade for the entire cutting edge permits low cost repair by replacing only the damaged segment of the blade.

Referring now to FIGS. 3, 4, 5 and 6, the upper portion 42 of the blade 32 is flat so as to facilitate attachment to the transverse plate 28. The lower portion of the blade 32 is corrugated as illustrated at 44, and terminates in a scalloped edge 45. The bottom surface 46 of blade 32 is parallel to the direction of movement of the excavator which is parallel to surface 30 of the earth. The blade is self-sharpening and as it wears the scalloped cutting edge is maintained. For instance the blade may wear to the condition shown by dashed line 47 in FIGS. 3, 4 and 6, and in such condition its edge will still have the desired scalloped shape.

As shown in the top view of FIG. 1, the scalloped shape of cutting edge 45 provides a horizontal angle α to the direction of cutting movement indicated by arrow 50 which produces a highly desired slicing action such as that provided by the share of a moldboard plow. This slicing action occurs over a substantial portion of the cutting edge.

The blade of this invention provides an unobvious but desired result in that the loading characteristics of a bowl type earth mover using such a blade are improved materially. The material passing from the corrugated portion of the blade to the smooth portion of the blade tends to break up in the transition from the uneven corrugated portion to the smooth portion. This crumbling of the excavated material produces easier and fuller loading of the bowl and mitigates the jamming or packing of layers of excavated material which occurs in conventional earth movers when working in relatively cohesive earth for instance.

From the foregoing it is evident that applicant has provided a novel cutting blade for an excavator which is low in cost, and provides a highly desired slicing action in its cutting operation. This blade may be standard equipment rather than special equipment and will eliminate the requirements for special cutting teeth to a considerable extent. The corrugated blade end not only provides a desired slicing action but is also self-sharpening and maintains the scalloped or corrugated cutting edge, even when worn to a considerable extent. Also the corrugated portion of the blade serves a highly desired function of crumbling the material as it is cut. This occurs as the material passes from the corrugated portion 44 to the flat portion 42.

Although a single embodiment of this invention has been illustrated and described, it is not intended to limit this invention except as necessitated by the scope of the appended claim.

What is claimed is:

In an excavator including a bowl having a horizontally disposed bottom, side walls extending upwardly from the bottom and a transverse support on said bowl extending

3

downwardly and forwardly of the forward end of said bottom disposed at an acute vertical angle and substantially at a right horizontal angle to the direction of movement of the excavator during excavation, a blade having a flat upper portion and a corrugated lower portion terminating in a scalloped cutting edge, means securing said upper portion to said support whereby said blade is disposed at an acute vertical angle and substantially at a right horizontal angle to the direction of movement of said excavator during excavation, and an end surface on said lower portion lying in a plane parallel to said direction of movement of said excavator during excavation, said corrugated portion constituting a substantial portion of said blade whereby a scalloped cutting edge is maintained during the wearing away of a substantial part of the lower portion of said blade.

5

10

15

218,566
969,469
1,419,524
1,741,933
1,765,218
2,015,109
2,074,081
2,349,576
2,722,065
2,778,129

69,625
807,036
92,888

4

References Cited in the file of this patent

UNITED STATES PATENTS

Peek	Aug. 12, 1879
Gose	Sept. 6, 1910
Seyms	June 13, 1922
Gunnison	Dec. 31, 1929
Erhart	June 17, 1930
Hays	Sept. 24, 1935
Burns	Mar. 16, 1937
Daniels	May 23, 1944
Smith	Nov. 1, 1955
Fryer	Jan. 22, 1957

FOREIGN PATENTS

Sweden	Feb. 18, 1928
Germany	June 25, 1951
Norway	Sept. 20, 1958