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Guest

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[54] **ASPHALT CUTTING ATTACHMENT FOR BACKHOE BUCKET**

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[51] **Int. Cl.** **E01c 23/09**

[58] **Field of Search** 299/40; 37/117.5, 37/DIG. 12; 172/777, 778; 214/145

[56] **References Cited**

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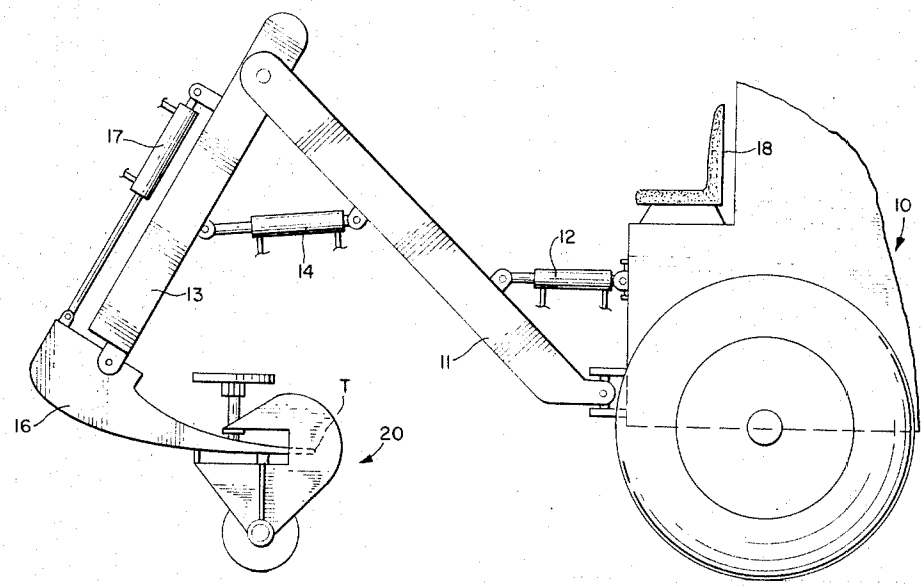
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[57] **ABSTRACT**

An asphalt cutting attachment for the bucket of a backhoe or similar motor vehicle mounted bucket: a pair of plates are spaced apart so as to avoid interference with the bucket teeth, if any, and have a slot for receiving the front lip of the bucket. Below the bucket lip, front and rear laterally extending bars provide stability against twist, as does a pair of bearing surfaces provided by edges of the plates defining the slot.

11 Claims, 3 Drawing Figures



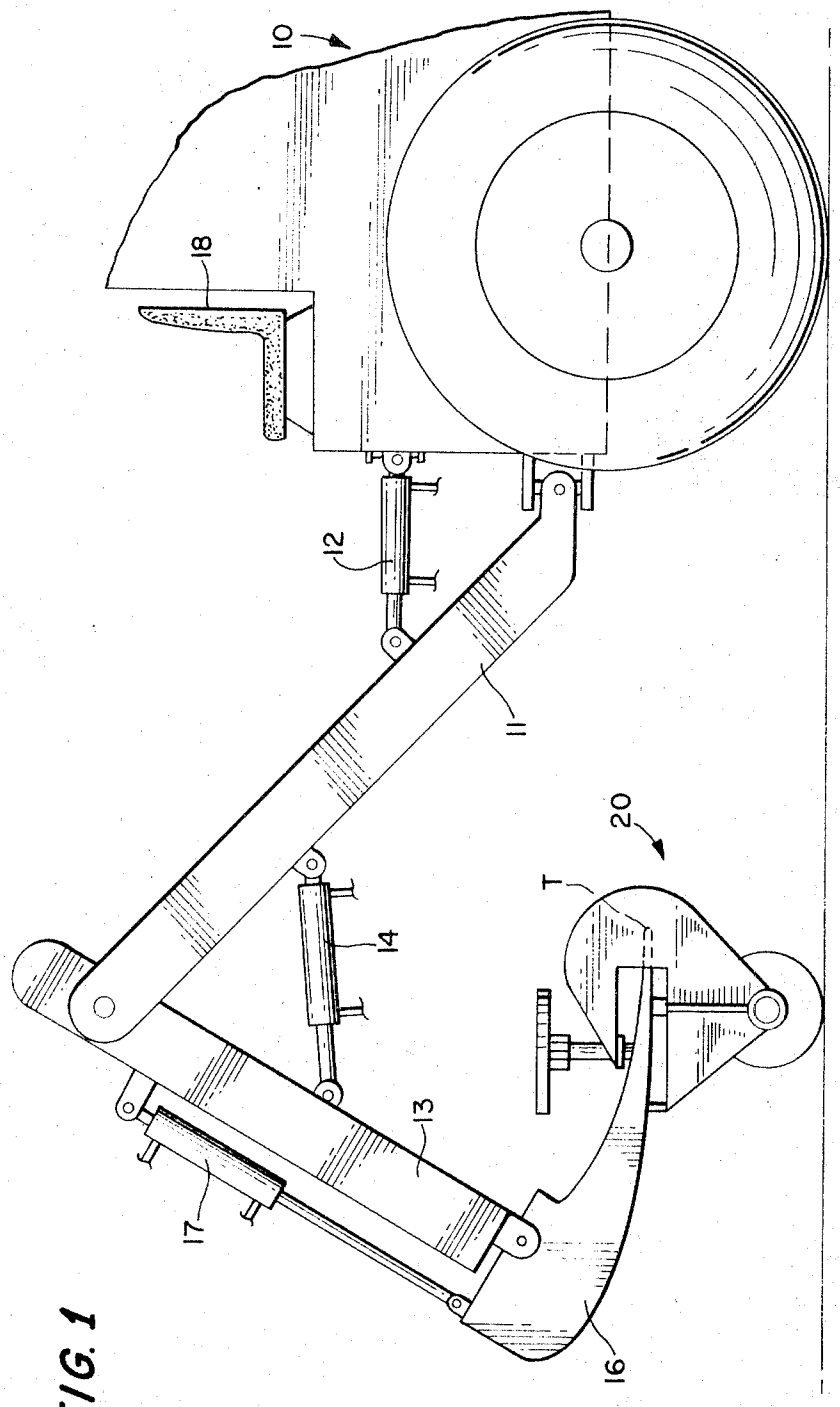


FIG. 1

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FIG. 3

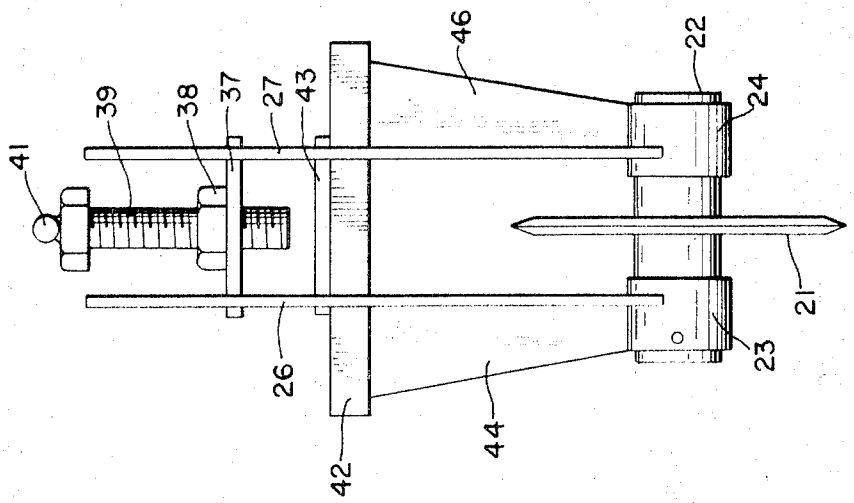
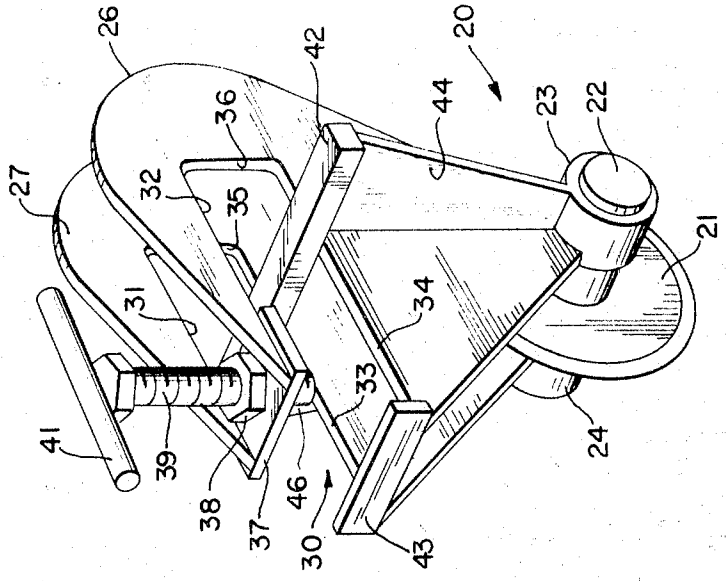


FIG. 2



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ASPHALT CUTTING ATTACHMENT FOR BACKHOE BUCKET

BACKGROUND OF THE INVENTION

The present invention relates to an attachment for cutting asphalt pavement, for use on the bucket of a backhoe or other vehicle-mounted bucket.

In performing work such as installing, repairing and replacing various utility lines, such as water, sewer and gas conduits, and electric and telephone lines, buried in the ground beneath paved roadways or streets, there is a need to dig a narrow ditch or trench. In order to do this, the upper pavement layer, which is frequently of asphalt, must be removed. Similarly, in connection with other work such as road widening projects, the asphalt upper layer must also be removed. This requirement, and procedures for effecting the work have long been known.

Formerly, pneumatic hammers or jack hammers were used, having cutter bits, the workmen making a number of incisions in the asphalt paving in a pair of roughly straight, parallel lines. The asphalt being cut, was then removed, and subsequent layers and the soil were then removed until the pipe line or electric conduits were reached. The utilization of the penumatic hammers was considered to be considerably time consuming, and therefore expensive. As a result, other approaches to the problem have been proposed.

Amongst the other approaches were the scarifying of the asphalt by the teeth of a bucket carried by power equipment. This did not prove to be satisfactory, either, and so there were developed a number of devices which are designated as asphalt cutters. Generally speaking, these devices had in common the provision of a disc having a substantially sharp peripheral cutting edge. These known asphalt cutting devices have been deficient in a number of ways, as will be pointed out hereinbelow.

One proposal for an asphalt cutter embodied a motorized attachment for connection to the lift arms of a tractor, or for mounting on a trailer or the like. This proposal is objectionable as being unduly expensive, requiring a contractor to purchase a relatively large and complex item of equipment. Another proposal known in the prior art provided for attachment of a cutting disc and supporting structure to the side of a road roller. This proposal has the deficiency that it is extremely difficult for the operator of the road roller to manipulate the machine so as to provide accurate positioning of the cutting disc for the cutting operations, and is therefore not completely satisfactory.

Similarly deficient are proposals for mounting a cutting disc on a dozer blade, usually mounted on a tractor. The cutting attachment disc is not visible to the operator of the tractor during the cutting operation, so that desirable accuracy of the placement of the cut being made is not achieved.

A proposal which has experienced considerable development by the workers skilled in the art involves the provision of an attachment for the mold board of a grader. While these attachments have been produced at a comparatively low cost, due to the fact that the asphalt cutter attachment is mounted on the mold board beneath the motor grader body, it is not readily visible to the grader operator, and here again problems with accuracy of alignment have occurred. The preceeding equipment involves the use of machines not normally

used in a small utility repair or installation work. Still another proposal has been of an attachment for use on a backhoe (a motorized vehicle having an upwardly extending boom pivoted to the vehicle at its lower end, and a downwardly extending boom pivoted to the upper end of the upwardly extending boom, the downwardly extending boom having a bucket or hoe attachment at the lower end thereof), the proposal involving the replacement of the bucket or hoe by the asphalt cutting attachment. This proposal has not been entirely acceptable because it has been found that a suitable length of cut of the asphalt can be made in approximately five minutes of operation. However, to remove the backhoe bucket or hoe, and to then attach the asphalt cutting attachment in its stead has required approximately twenty minutes. Consequently, it will be seen that this equipment has required a total time consumption of approximately 45 minutes of approximately a 5 minute utilization of the asphalt cutting attachment, including the operations of removing the bucket or hoe, attaching the asphalt cutting attachment, cutting the asphalt, removing the asphalt cuttich attachment and re-installing the bucket or backhoe. Consequently, this equipment has not been as efficient as desirable.

SUMMARY OF THE INVENTION

The present invention provides an asphalt cutting attachment which is mounted on the bucket or hoe of a backhoe or similar motor vehicle having a bucket or the like supported by one or more booms. The attachment comprises a cutting disc supported on an axle, the axle in turn being carried a pair of parallel spaced plates which are generally in the shape of a C. The C-shape of the spaced plates provides a slot, and the attachment is placed on the bucket or hoe so that the forward edge or lip of the bucket or hoe extends into the slot, the forward edge itself bearing against bearing surfaces provided by the plates at the closed end of the slot. A pair of bars are carried by the plates, extending generally parallel to the cutting disc axle, and lying adjacent the slot, on the underside of the bucket, and engaging the underside of the bucket. A clamping device for cooperation with the bars is provided for engagment with the upper surface of the bucket or hoe bottom, this clamping device being a screw threaded rod which is received in an internally threaded member carried by and between the two spaced plates. Thus, due to the engagement of the bucket or hoe by the attachment at the front edge of the bucket or hoe, across the bottom surface of the bucket or hoe, and on the upper surface of the bottom of the bucket or hoe, great stability is provided, with simple but effective clamping action and equipment. Since the attachment may be provided on the backhoe, it is visible to the operator, thereby providing for accuracy of the cutting operation.

It will accordingly be seen to be among the objects of the present invention to provide an asphalt cutter attachment which is of simple, economical construction, and which may be easily fabricated from readily available materials. Other objects of the present invention include the provision of an asphalt cutter attachment requiring no modification of existing equipment, as by weldments thereto, to provide an attachment which can be mounted on the center line of a vehicle and thereby be readily visible during cutting operations to

the vehicle operator, to provide an attachment which is sturdy and secure against accidental shifting out of position by the stresses imposed during use thereof, and it is a further object of the present invention to provide a cutting attachment which can be mounted on and dismounted from existing equipment, such as a backhoe, with great rapidity and without special tools or auxiliary fittings.

DESCRIPTION OF THE DRAWING

FIG. 1 is an elevational view of an earth moving vehicle, in the nature of a backhoe, having the present invention asphalt cutter attachment thereon.

FIG. 2 is a perspective view of the asphalt cutter attachment of the present invention.

FIG. 3 is an elevational view of the attachment shown in FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, wherein like or corresponding reference numerals are used to designate like or corresponding parts throughout the several views, there is shown in FIG. 1 a motorized earth working vehicle **10**, vehicle **10** specifically being a backhoe, and including an upwardly extending boom **11** which is pivotally secured at its lower end to the vehicle **10**. Movement of the boom **11** may be effected by any conventional means, such as the hydraulic cylinder **12**, which will effect movement of boom **11**, in a vertical plane. Such vehicles conventionally provide for movement of the boom **11** in a horizontal plane, and it is contemplated that such a vehicle is here disclosed, although details of the horizontal movement of the boom **11** are not shown as being well understood by those skilled in the art. Attached to the upper end of boom **11**, is a second, generally downwardly extending boom **12**, movement of which may be effected in a conventional manner by a hydraulic cylinder **14**. At its lower end, boom **13** has pivotally connected to it a hoe or bucket **16**, and a hydraulic cylinder **17** is provided for effecting rotational movement of the bucket **16** about the lower end of the boom **13**. The bucket **16** is of conventional construction, comprising a bottom and a pair of spaced, upstanding side walls joined to the bottom, the bottom having a forward lip, or leading edge. The vehicle **10** may include an operators station **18**, where an operator has accessible to him controls for effecting movement of the various parts hereinabove described.

Attached to the bucket **16** is the asphalt cutting attachment **20** of the present invention.

Referring now to FIG. **2**, the asphalt cutter attachment **20** of the present invention may be seen to comprise a cutting disc **21** which is rotatably supported by an axle **22** carried by a pair of bushings **23** and **24**. A pair of spaced plates **26** and **27** are provided of substantially identical size and shape. Specifically, the shape of the plates **26** and **27** is roughly that of a "C", providing a slot generally designated **30**, defined by downwardly facing edges **31** and **32** and upwardly facing edges **33** and **34**. The edges **31** and **32** are connected to the edges **33** and **34** by the bearing surface edges **35** and **36** respectively.

The spacing of the plates **26** and **27** is of significance in that they are spaced so as to accommodate between them a tooth of any standard backhoe or similar equipment currently manufactured. Specifically the spacing between the plates **26** and **27** is 3⅜ inches, it having been determined by careful analysis to be most practicable. In some instances, the tooth spacing will be considerably wider, and the two plates **26** and **27** will be accommodated between such more widely spaced teeth; the plates being approximately ½ inch in thickness, the overall width of the attachment from surface to surface of the plates will be 4⅜ inches.

Secured to the edges **31** and **32** of the plates **26** and **27** as by welding is a pad **37** having a hole therethrough, with a nut **38** welded to the upper surface thereof, nut **38** lying between the plates **26** and **27**, as shown. Threaded into the nut **38** is a screw **39** having a transversely extending handle **41** secured to the upper end thereof, to thereby permit easy manipulation of screw **39**, and the application of sufficient force thereto.

Secured to the edges **33** and **34** of the plates **26** and **27** are a pair of stabilizer bars **42** and **43**, stabilizer bar **42** being located directly above the bushings **23** and **24**, with gussetts **44** and **46** extending between the bar **42** and the busings **23** and **24**, respectively, and secured to the plates **26** and **27**, all securement preferably being by welding.

Referring now to FIG. **3**, there may be seen the plates **26** and **27**, spaced as above noted, with the pad **37**, nut **38** and screw **39** between them. There may also be seen at the lower end thereof the cutter wheel **21**, axle **22** and bushings **23** and **24**. Also to be seen are the gussetts **44** and **46**, which extend upwardly to the underside of the stabilizer bar **42**.

To attach the asphalt cutter attachment **20** to a bucket **16**, the leading or digging edge of the bucket **16** is passed into the slot **30**, with a tooth T, if any, (see FIG. **1**) passed between the plates **26** and **27**. The bottom surface of the bucket or hoe **16** will be engaged by the bars **42** and **43**, and the leading edge of the bucket **16** will seat in engagement with the bearing surfaces or bearing edges **35** and **36** of the plates **26** and **27**. Then, the handle **41** will be manipulated to cause the lower end of screw **29** to descend into clamping engagement with the upper surface of the bottom of bucket **16**, thereby clamping the bottom plate of bucket **16** between the stabilizer bars **42** and **43** and the screw **39**. Due to the lateral extent of these bars, rotation of the attachment about a generally horizontal axis parallel to the vehicle longitudinal axis (see FIG. **1**) will be prevented. Also, rotational movement of the attachment **20** about a vertical axis will be prevented by virtue of the engagement of the leading edge of the bucket **16** with the bearing edges **35** and **36**.

In use, as will be readily understood, the attachment **20** is capable of being very rapidly mounted and dismounted from the bucket of the backhoe or similar equipment, without the necessity of special tools, auxiliary fittings, or modification of the bucket. The attachment **20** can be placed substantially on the center line of the vehicle **10**, so that it is visible to the equipment operator during cutting operations. Due to the above described construction of the attachment **20**, it may be economically fabricated of readily available materials, and will be sturdy and strong during use, and will not be shifted from its position on the bucket during the asphalt cutting operations due to the significant stresses imposed thereon.

It will be obvious to those skilled in the art that various changes may be made without departing from the

spirit of the invention and therefore the invention is not limited to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

I claim:

1. An asphalt cutting attachment for a backhoe or the like comprising:

a. a cutting disc,

b. axle means for rotatably supporting said disc,

c. support means for said axle means including means defining a slot generally parallel to said axle means, said support means comprising a pair of spaced parallel plates which are generally C-shaped and define a pair of bearing edges at one end of said slot, for engagement with an edge of the bucket of a backhoe, and

d. releasable clamp means movable transversely of said slot defining means.

2. The asphalt cutter attachment of claim **1**, said clamp means comprising a pad between said plates on the opposite side of said slot from said axle means, and screw means threaded through said pad.

3. The asphalt cutter attachment of claim **1**, and further comprising stabilizer bar means extending parallel to said axle means, said stabilizer bar means being on said plates adjacent said slot and on the side thereof closest to said axle means.

4. The asphalt cutter attachment of claim **1**, and further comprising stabilizing means extending generally parallel to said axle means.

5. In combination with a motor vehicle including boom means mounted for movement in a vertical plane and having bucket means on said boom means, said bucket means comprising a bottom having a forward lip and spaced side walls joined to said bottom and upstanding therefrom, said motor vehicle including an operator's station for operation and control of the boom providing substantially unimpeded viewing of the bucket means, an asphalt cutter attachment comprising a cutting disc, axle means for rotatably supporting said cutting disc, support means for said axle means including means defining a slot, the lip of said bucket means being in said slot, said attachment further comprising releasable clamp means for engaging said bucket means.

6. The combination of claim **5**, said attachment comprising a pair of bearing means engaging the forward edge of the lip of said bucket and spaced laterally of a plane passing through said cutter disc.

7. The combination of claim **6**, said attachment comprising a pair of spaced stabilizer bars extending generally parallel to said axle means and engaging the bottom surface of said bucket means.

8. The combination of claim **5**, said attachment comprising a pair of spaced stabilizer bars extending generally parallel to said axle means and engaging the bottom surface of said bucket means.

9. The combination of claim **8**, said clamping means comprising screw threaded means engaging the upper surface of said bucket means.

10. The combination of claim **5**, said clamping means comprising screw threaded means engaging the upper surface of said bucket means.

11. The combination of claim **5**, wherein said support means comprises a pair of spaced parallel plates which are generally C-shaped, and define a pair of bearing edges at one end of said slot for engagement with the lip of said bucket means.

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