

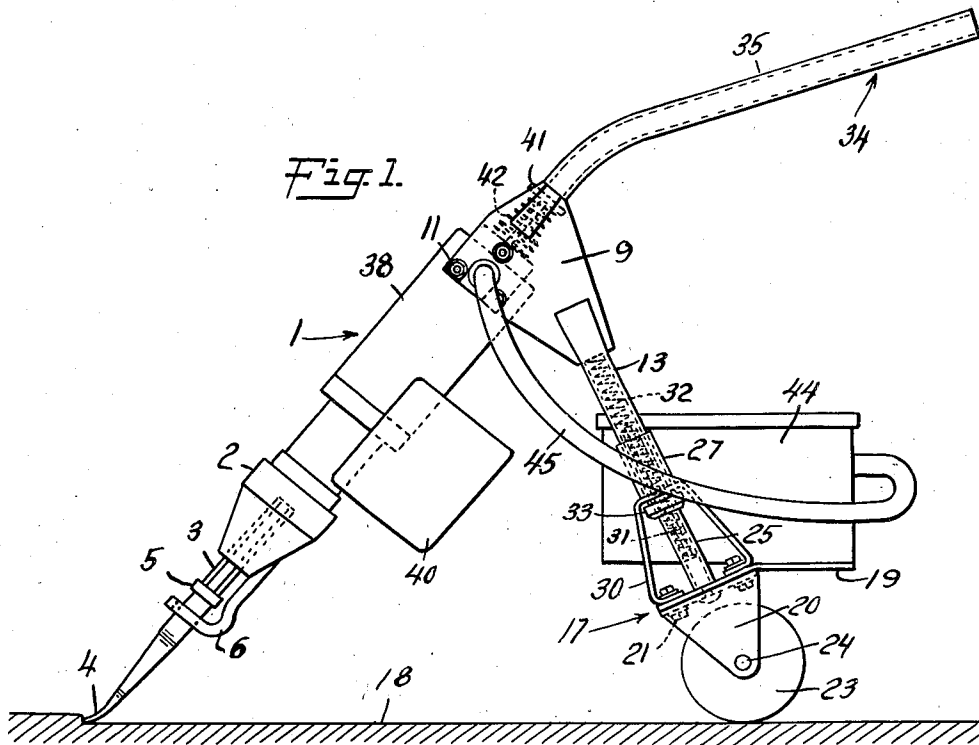
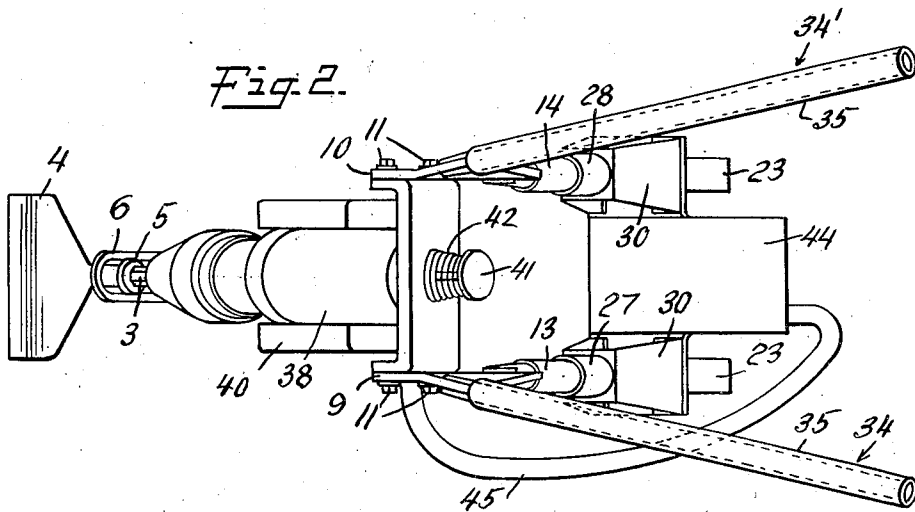
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S. P. MILLER

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ROOF SCRAPING APPARATUS

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INVENTOR
Stuart P. Miller

BY *Forbes Libby*
ATTORNEY

UNITED STATES PATENT OFFICE

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ROOF SCRAPING APPARATUS

Stuart Parmelee Miller, Scarsdale, N. Y., assignor to The Barrett Company, New York, N. Y., a corporation of New Jersey

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This invention relates to apparatus for removing the gravel surfaces of roofs preparatory to repairing or re-roofing them.

In re-roofing or repairing old roofs with composition roofing such as bitumen-impregnated felt base roofing material, it is necessary to provide a surface on which the new roofing material may satisfactorily be laid to obtain optimum roof life and service. To accomplish this, it is customary to remove from the old roof the stone, gravel or other mineral surfacing material together with a certain amount of the bitumen in which it is embedded in order to obtain a clean, fresh, foundation surface which is reasonably free from irregularities and with which the bitumen of the new roof covering will form a satisfactory bond. For example, in re-roofing builtup roofs having alternate layers of felt and bituminous coating material with a layer of gravel forming the wearing surface partially embedded in a coating layer, it is desirable to remove the gravel layer, together with some of the coating material, with as little damage to the felt as possible.

Heretofore this work has been largely done by hand. With experienced workmen the results may be fairly satisfactory, but under the best conditions the operation is time-consuming and the labor costs high.

Rotary surfacing machines have been designed for this work, but because of their size, weight and power requirements they are inherently ill adapted for use on any but large jobs. They have not come into general use because of this and because of weakness of design of those actually available.

It is an object of this invention to provide an easily manipulated apparatus of low power requirements for expeditiously preparing the surfaces of old roofs for the application of new roofing. It is a further object to provide an apparatus of such light weight that it is portable and can be used on roof decks of light construction which would be strained by use of the heavy machines hitherto available. It is a further object to provide a machine that will operate close to parapet walls and in corner-areas inaccessible to the rotary type of scraper. Other objects and advantages will appear from the following detailed description of my invention.

The apparatus of my invention comprises a reciprocatory cutter or scraper member, the cutting or scraping portion of which is curved parallel to its edge, a motor for imparting reciprocatory motion to the scraper member and a

movable support for supporting the apparatus with the scraper member in contact with and at an acute angle to the surface operated upon. In the preferred embodiment of my invention, the motor and scraper are mounted for pivotal and translational movement upon a resilient support; the apparatus is equipped with handle means readily manipulable by an operative to tilt the scraper member about its cutting edge as a pivot for adjusting the angle at which the blade engages the roof thus gauging the depth of cut and to move the apparatus along the desired path over the roof. The handle means may also be manipulated to pivot the apparatus about the resilient support and raise the scraper blade, e. g., when it is desired to move the apparatus without performing a scraping operation. The resilient support also functions to absorb shocks arising during operation and movement of the apparatus.

In the accompanying drawing, forming a part of this specification and showing for purposes of exemplification a preferred form of apparatus involving this invention,

Fig. 1 is a view in side elevation of my apparatus; and

Fig. 2 is a top plan view thereof.

In the drawing reference numeral 1 designates a reciprocatory motor having reciprocably mounted in the lower end of the frame 2 thereof the shank 3 of scraper blade 4, which blade is of curved configuration adjacent its forward edge, the axis of curvature being parallel to the forward edge of the blade, to provide a concave upper surface and a convex lower surface. The scraper blade may be of a width of from 6 to 10 inches and is preferably about 8 inches wide. The shank is provided with an enlarged portion 5 which co-acts with the lower end of motor frame 2 and the guard 6 attached thereto to limit the oscillatory movement of the scraper both toward and from the motor frame.

Plates 9, 10 of generally triangular configuration are attached to each side of the upper end of the motor frame by suitable securing means such as bolts 11. Rigidly secured to the lower corner of each of the plates 9, 10 is a resilient support for the apparatus including hollow tubular guides 13, 14, wheel-carrying frame designated generally by reference numeral 17, and a resilient, telescopic connection between the guides and frame. The dimensions of the resilient support are preferably such that with the apparatus in the position shown in Fig. 1, the motor and scraper 4 are inclined at an angle

of from 45° to 60° to the roof 18 or other surface to be scraped.

The wheel-carrying frame is constituted of a plate 19 having two wheel carrying forks 20 secured to the lower side thereof by bolts 21, and wheels 23, preferably of rubber tired construction, journaled on axles 24 mounted in the forks. Tubular guides 25 mounted on the upper side of plate 19 telescope upwardly within downwardly extending guides 13, 14 and guide tubes 27, 28 secured to plate 19 by stirrup extensions 30 and bolts 21, slidably engage the exteriors of guides 13 and 14 respectively. Guide rods 31 are mounted in each of the assemblies of concentric guide tubes; surrounding the rods within the tubes are helical springs 32 which urge wheeled frame 17 downwardly and the motor and guides 13, 14 upwardly. Disengagement of the set of guides 13, 14 from the sets of guides 25, 27 and 28 is prevented by stops 33 on the lower ends of guides 13, 14.

Secured to the rear corners of plates 9, 10 are rearwardly extending handles 34, 34' preferably equipped with rubber grips 35.

It will be appreciated that the motor of my apparatus may be of the internal combustion, pneumatic or electric type commonly employed in percussion hammers now on the market and since such motors per se are well known, I have not described the motor construction in detail. In the drawing, I have shown schematically a motor of the internal combustion type having a cylinder 38 equipped with a reciprocating piston (not shown), a motor fuel tank 40, and a foot-operated plunger 41 surrounded by spring 42 adapted to be actuated by foot pressure to start the motor. The shank 3 of scraper blade 4 is detachably connected for operation by the motor, but since such detachable connections are common in percussion hammers, I have not described the connection in detail. Where, as in the illustrated embodiment of the invention, an internal combustion engine is employed, plate 19 forms a convenient support for the battery 44 for supplying electric current to the motor ignition system, the battery being connected to the motor 1 by an electric cable 45.

The operation of my apparatus is as follows: The motor is started to impart reciprocatory motion to the scraper blade, for example, in the case of the internal combustion motor illustrated on the drawing, the ignition is turned on and the plunger 41 is depressed to start reciprocation of the piston. The operative grasps the handles 34, 34' and tilts the apparatus to engage the cutting edge of the reciprocating scraper blade 4 with the roof surface. As hereinabove described, the reciprocatory scraper blade is curved adjacent its forward edge so that the axis of curvature extends parallel to the edge and is located above the blade. This curvature and the inclined position of the blade causes the forward edge of the blade to exert a relatively large component of the total force exerted thereby in a horizontal direction and results in a scraping as distinguished from a digging action on the roof surface. As the apparatus scrapes the roof the operative manipulates the handles 34, 34' to move the apparatus forward over the roof and to compress or expand springs 32 thus tilting the frame 1 and the scraper blade about its cutting edge as a pivot to vary the angle between the blade and the roof, thus gauging the depth of cut of the scraper blade and removing the desired amount of the old roof surface.

It will be appreciated that owing to the support afforded by springs 32, exertion of only a relatively small raising or lowering force on the handles 34, 34' is sufficient to pivot the scraper blade about its cutting edge.

The resilient connection between the wheeled frame 17 and the motor absorbs shocks between the motor and frame, minimizes vibration of the roof engaging wheels 23 by the motor and hence prevents damage to the roof deck which might otherwise result from vibration of the wheels, as well as permits tilting of the frame 1 and scraper blade about the edge of the blade as a pivot to gauge the depth of cut. The shock-absorbing connection also enhances the smoothness of operation of the apparatus, permits easy control without excessive shocks to the operative and minimizes breakage of the apparatus which might otherwise occur when the scraper blade 4 strikes a substantial obstruction such as a large nail.

By the term "curved" as used herein, it is intended to include blades of angular cross section.

In comparative tests it has been found that one operator with the above-described machine can scrape a much greater area of old built-up roofing for a reroofing operation in a given time than can be scraped with hand tools by an experienced workman, and that the machine-scraped surface will be more regular and the underlying felt less damaged than is the case with hand tools heretofore used. Complete preparation for reroofing includes cleaning the roof after scraping; the time required for cleaning is about the same in the case of both machine and hand scraping. An operator with the machine of this invention can completely prepare a built-up roof for reroofing, i. e., scrape and clean, six or more times as fast as an experienced workman with hand tools, and can do a better job.

From the above it will be seen that the machine of this invention is cheap to operate, light in weight, portable, adapted for use on both large and small jobs, operable by gasoline, compressed air or electricity when fitted with the appropriate motor, has low power requirements, and can remove old surfacing from areas which cannot be reached by available rotary scrapers, e. g., areas close to parapet walls (especially wall corners) and around roof obstructions such as ventilators and penthouses.

It is to be understood that this invention is not restricted to the present disclosure otherwise than defined by the appended claims.

What is claimed is:

1. Roof scraping apparatus comprising in combination an inclined motor, a roof scraper blade detachably connected to the lower end of said inclined motor for reciprocation thereby, said scraper blade being curved in the neighborhood of its roof engaging edge so that the axis of curvature extends substantially parallel to said edge and is located above said blade to provide an upper surface of concave configuration and a lower surface of convex configuration, handle means extending rearwardly from said motor and means for supporting said motor and blade for pivotal and translational movement on said roof surface, said last named means including a frame, roof engaging wheels on said frame and a resilient telescopic connection between said frame and said motor, said telescopic connection permitting said motor and blade to be tilted about the edge of said blade as a pivot by manipulation of said handle means.

2. Roof scraping apparatus comprising in combination an inclined reciprocatory motor, a roof scraper blade detachably connected to the lower end of said motor for reciprocation in an inclined plane thereby, said scraper blade being curved in the neighborhood of its roof engaging edge to provide an upper concave surface and a lower convex surface, the axis of curvature extending substantially parallel to the roof engaging edge of said blade, a handle extending generally rearwardly from the upper end of said motor, means for resiliently supporting said motor and blade for pivotal and translational movement on said roof surface, said supporting means including a set of downwardly extending tubular guides connected to said motor in the neighborhood of its upper end, a frame, roof engaging wheels on said frame, a set of guides on said frame telescoping with said first named guides and resilient means within the sets of guides for urging said motor in a direction away from said frame.

3. Roof scraping apparatus comprising in combination an internal combustion motor, a roof scraper blade detachably connected to said motor for reciprocation in an inclined plane thereby, handle means for said motor, means for supporting said motor and blade for pivotal and translational movement on said roof surface, said supporting means including a plate, a pair of wheels attached to and located beneath said plate, whereby said plate spaces said wheels horizontally, and a resilient connection between said plate and said motor, said plate providing a support for the battery box for supplying current for the ignition system of said motor, said resilient connection permitting said motor and blade to be tilted about the edge of said blade as a pivot by manipulation of said handle means to gauge the depth of cut of said blade, said resilient connection also absorbing shocks from said motor to wheels.

4. Roof scraping apparatus comprising in combination a motor adapted to be supported in inclined relation to a roof surface, a scraper blade operatively connected to said motor for reciprocation thereby, a pivotal support mounted on said motor and extending downwardly therefrom to support said motor and scraper pivotally on said roof surface with said scraper extending at an acute angle to said surface, said support including a substantially expansible and compressible resilient connection, and handle means attached to said motor whereby an operative may by movement of said handle means substantially instantaneously pivot said motor and blade about said pivotal support to raise said scraper blade out of engagement with said surface, said handle means being also manipulable to tilt said motor and blade substantially instantaneously about the forward edge of said blade as a pivot to continu-

ously gauge the depth of scrape and move said apparatus over the surface to be scraped.

5. Scraping apparatus comprising in combination a scraper blade, a motor connected to said scraper blade for reciprocating the same in contact with a surface to be scraped, supporting means including a resilient connection for supporting said motor and blade at an acute angle to the surface to be scraped and means manipulable to compress or expand said resilient connection to tilt said scraper blade about its scraping edge as a pivot for varying the angle between the blade and the surface to be scraped, thereby gauging the depth of cut of said blade.

6. Roof scraping apparatus comprising in combination an inclined reciprocatory motor, a roof scraper blade detachably connected to the lower end of said motor for reciprocation in an inclined plane in contact with a roof, means for resiliently supporting said motor and blade for pivotal and translational movement on said roof surface, said last named means including a pair of roof engaging wheels and a spring connection between said wheels and said motor, and handle means extending rearwardly from said motor, said handle means being manipulable to raise and lower the upper end of said motor thereby varying the tension of said spring connection and tilting said motor and blade about the cutting edge of the blade as a pivot for varying the angle between the blade and the roof to gauge the depth of cut, said handle means being also manipulable to tilt said apparatus about said wheels as a pivot to raise said scraper blade out of contact with or lower the blade into contact with the roof.

7. Roof scraping apparatus comprising in combination an inclined reciprocatory motor, a roof scraper blade detachably connected to the lower end of said motor for reciprocation in an inclined plane in contact with a roof, means for resiliently supporting said motor and blade for pivotal and translational movement on said roof surface, said last named means including a pair of roof engaging wheels, telescoping guides between the upper end of said motor and said wheels and spring means for urging said motor in a direction away from said wheels, and handle means extending rearwardly from said motor, said handle means being manipulable to raise and lower the upper end of said motor thereby compressing or expanding said spring means and tilting said motor and blade about the forward edge of the blade as a pivot for varying the angle between the blade and the roof to gauge the depth of cut, said handle means being also manipulable to tilt said apparatus about said wheels as a pivot to raise the scraper blade out of contact with or lower the blade into contact with the roof.

S. P. MILLER.