May 11, 1965 H. M. QUAKENBUSH 3,182,535

SCORING MACHINE

Filed March 7, 1962 2 Sheets-Sheet 1

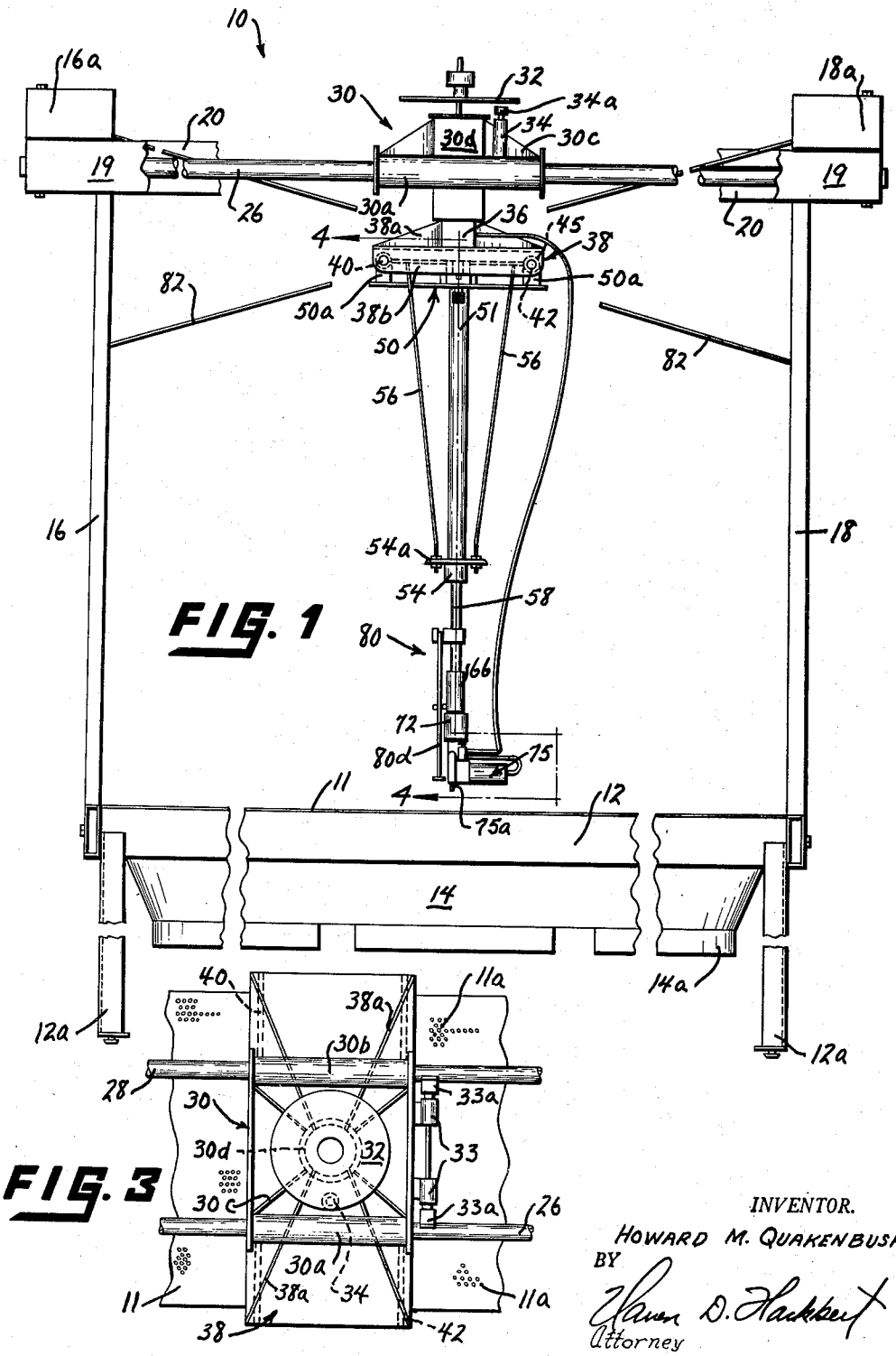


FIG. 1

FIG. 3

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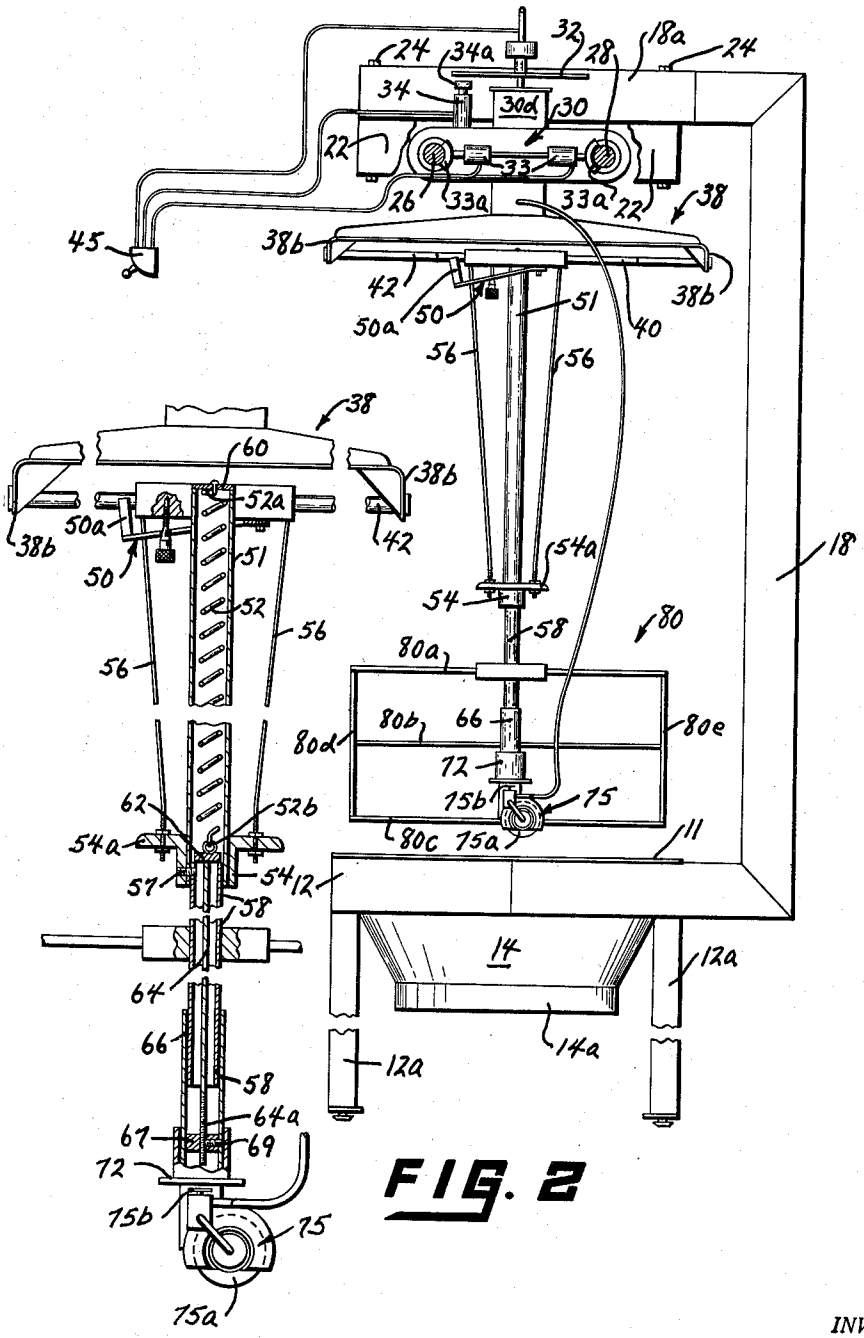


FIG. 2

FIG. 4

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United States Patent Office 3,182,535 Patented May 11, 1965

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3,182,535

SCORING MACHINE

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Filed Mar. 7, 1962, Ser. No. 178,184
2 Claims. (Cl. 83—8)

The present invention relates to a scoring machine, and more particularly to new and improved apparatus for uniformly slitting a material to any desired pre-selected depth.

As is known, it is becoming increasingly popular to upholster furniture with a sculptured or patterned effect insofar as, for example, the backs and arms are concerned. Typically, such furniture is manufactured through the use of pre-assembled upholstered portions defined by a scrim to which a layer of foam, such as polyurethane, is secured, where such foam has the desired final upholstery pattern outlined thereon in the form of slits. The aforesaid slits extend to any pre-selected depth into the foam and, in final pre-assembly, are adapted to receive hems of the upholstery fabric. Restated otherwise, portions of the cover fabric for the upholstered unit are tucked into the slits into the foam, and, subsequently, smoothed so as to provide a pre-assembly which affords a pleasing outward appearance.

In any event, difficulty has been encountered heretofore in defining, the aforesaid slits in the foam, particularly as the desired patterns are oftentimes complex in configuration, i.e. involve various circular and angular movements on the part of the operator, and, additionally, oftentimes lacked the desired uniform depth which provides for the best outward appearance upon complete assembly of the unit.

By virtue of the instant invention, the applicant herein has provided a new and novel scoring machine, i.e. a machine for defining slits in a given material, where such scoring machine is highly flexible in usage, providing versatility for the operator in that patterns can now be attained which formerly could not be realized through prior techniques. Additionally, and importantly, the scoring machine automatically provides a uniform depth to the desired slits, therefore affording a decided advantage, for example, in the assembly of upholstered furniture.

Broadly, the applicant's new and novel scoring machine is defined by a work-receiving area having framework disposed thereover onto which the operating head of the apparatus is movably mounted. In this latter regard, the movement of the operating head can be termed universal, i.e. it is capable of moving in all directions, while another feature of the apparatus is its ready usage upon limited movement of the operator's hand.

Accordingly, the principal object of the present invention is to provide a new and novel scoring machine having particular application in the upholstery industry.

Another object of the present invention is to provide a new and novel scoring machine which, because of its universal type mounting arrangement, is highly versatile in use.

Still another object of the present invention is to provide a new and novel scoring machine which slits the material being processed to a uniform pre-selected depth.

A still further and more general object of the present invention is to provide a new and novel scoring machine which combines simplicity and effectiveness in use, with relative ease of manufacturing the apparatus.

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Other objects and a better understanding of the present invention will become more apparent from the following description, taken in conjunction with the accompanying drawings, wherein,

FIG. 1 is a view in front elevation, partly fragmentary, showing a scoring machine made in accordance with the instant invention;

FIG. 2 is a view in side elevation of the scoring machine of FIG. 1;

FIG. 3 is a fragmentary top plan view showing certain structural details of the applicant's invention; and,

FIG. 4 is a view in vertical section, partly fragmentary, taken at line 4—4 of FIG. 1 and looking in the direction of the arrows, showing still further structural details of the instant invention.

For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the embodiment illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, such alterations and further modifications in the illustrated device, and such further applications of the principles of the invention as illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

Referring now to the figures, the applicant's new and novel scoring machine **10** is defined by a work-receiving surface **11** disposed on a framework **12** typically having supporting legs **12***a* at the respective corners thereof. A downwardly and inwardly tapered shroud **14** having a rim **14***a* is positioned by the framework **12** beneath the work-receiving surface **11**, where vacuum means (not shown for reasons of drawing simplicity), in the form of a pump, draws air through a pattern of apertures **11***a* in the work-receiving surface **11** (see FIG. 3) and through the aforesaid shroud **14**, the particular application of the vacuum means to be more fully described herebelow.

Extending rearwardly and upwardly from the sides of the support framework **12** are support members **16** and **18** (see FIGS. 1 and 2), where forwardly extending upper portions **16***a* and **18***a* thereof mount end members **21** and **22** of an oblong bracket assembly which also includes front and rear members **19** and **20** respectively extending between the aforesaid end members **21** and **22**, where the latter are secured to the aforesaid upper portions **16***a* and **18***a* of the support members **16** and **18** by means of bolts **24**. The end members **21** and **22** support parallel rods **26** and **28** which slidably receive mounting structure for the cutting apparatus, to be discussed herebelow.

In a typical embodiment of the invention, the aforesaid mounting structure, identified by the reference numeral **30**, comprises sleeves **30***a* and **30***b*, into which the parallel rods **26** and **28** are respectively received; a vertically extending member **30***d* which serves as a bearing for rotating the structure defining the cutting apparatus; and, reinforcing webs **30***c*.

A brake, in the form of a disc **32**, movable with the cutting apparatus, is positioned above the mounting structure **30**. Braking action is controlled by a pneumatically operated piston **34** which is disposed on a portion of the mounting structure **30**, so that a head **34***a*, forming part thereof, selectively engages the undersurface of the disc **32**, and, thereby, prevents rotatable movement of the cutting apparatus.

Other brakes, in the form of shoes **33***a* which are pneumatically controlled by pistons **33**, selectively lock the

mounting structure **30** against sliding movement along the parallel rods **26** and **28** (see FIG. 3). FIG. 2 illustrates the control **45** for the pneumatic system for controlling the operation of the brakes **32** and **33***a*, as well as the cutting blade motor, the latter to be discussed hereabove.

A support member **36**, rotatable within the aforesaid vertically extending member **30***d* positions a hood-like retaining structure **38** having reinforcement webs **38***a* and depending end flanges **38***b*, where the latter position other parallel rods **40** and **42** (see FIGS. 1, 2 and 4). The aforesaid parallel rods **40** and **42** slidably mount the upper portion of the cutting structure (see FIG. 4) defined, in part, by sleeve members **45**, where such parallel rods extend through the latter. As should be apparent from FIGS. 1 and 4, a screw controlled braking system, identified by the reference numeral **50**, is provided so that the sleeve members **45** and, hence, the cutting structure, may be selectively locked in any position along the length of the parallel rods **40** and **42**. It should be understood that actual braking action is achieved by the engagement of braking elements **50***a* with the parallel rods **40** and **42**.

In any event, extending downwardly from a plate extending between the sleeve members **45** is a hollow rod **51** having a spring **52** disposed therewithin. A collar **54** having a flanged portion **54***a* encircles the hollow rod **51**, where reinforcing members **56** angle upwardly therefrom to the plate extending between the sleeve members **45**. Another hollow rod **58** is received within the hollow rod **51**, where the former is maintained at a fixed position therein by reason of a set screw **57** which extends through the collar **54**, a portion of the hollow rod **51**, and into the hollow rod **58**.

The aforesaid spring **52** has one end **52***a* thereof fixedly secured to a member **60** which caps the upper end of the hollow rod **51**, where the other end **52***b* thereof is secured to a plate **62** having a rod **64** extending therefrom. As should be apparent from FIG. 4, the plate **62** is dimensioned so that the hollow rod **58** serves as a stop, insofar as downward movement of the plate **62** is concerned.

The aforesaid rod **64** is disposed within the hollow rod **58**, where still another hollow rod **66** encircles the hollow rod **58**. The hollow rod **66** has a control member **67** fixedly secured therewithin as, for example, by welding or the use of pins (neither shown). The aforesaid rod **64** has a threaded end **64***a* which is received in the control member **67**, where a set screw **69** extends through a portion of the hollow rod **66** and into the control member **67** for selective contact with the aforesaid threaded end **64***a* of the rod **64**.

The assembly is completed by a pneumatically driven cutting mechanism **75**, having a cutting blade **75***a*, secured to the bottom of the hollow rod **66**. A button **75***b* is typically provided for operating the cutting blade **75***a*, where another hollow sleeve-like rod **72** has a portion which is normally disposed on such button (not shown for reasons of clarity). The hollow sleeve-like rod **72** controls the operation of the cutting blade **75***a* when urged downwardly beyond its normal position on the button **75***b*.

A framework **80**, typically defined by generally horizontal members **80***a*, **80***b* and **80***c*, and end members **80***d* and **80***e*, is mounted on the cutting blade structure, at hollow rod **58**, for ease in following a pattern on the material under process. In other words, the framework **80** provides a type of "sight" on the work at hand. Moreover, the over-all scoring machine assembly is completed by the provision of reinforcement members **82** from one side to another.

It should be understood that the cutting blade **75***a* is normally in a raised position with respect to the work-receiving surface **11** by reason of the spring **52**. When the apparatus is put into use, the operator moves downwardly on the hollow sleeve-like rod **72**, causing the cutting blade **75***a* to operate due to the further engagement with the button **75***b*, and, simultaneously, causing the entire assembly to move downwardly, so that the cutting blade **75***a* moves into contact with the material on the work-receiving surface **11**. The limit of such downward movement of the cutting blade assembly is, as discussed hereabove, controlled by the plate **62** coming into contact with one end of the hollow rod **58** (as shown in FIG. 4).

As noted hereabove, an important advantage of the instant machine is the ability thereof to achieve a preselected slitted depth in a material, and one which is uniform throughout the pattern cut into such material. The aforesaid uniform cutting depth can be readily changed by releasing the rotation of the rod **64** through use of set screw **69** so that the control member **67** secured to hollow rod **66** can assume different positions along the threaded portion of the rod **64**. Thus, as the cutting mechanism **75** moves with the hollow rod **66**, the depth of the cutting blade **75***a* in the material is effectively and positively controlled.

In use, and after the desired depth dimension has been selected, as discussed hereabove, the work having a pattern inscribed thereon is laid upon the work-receiving surface **11**, and the pump means initiated so that the work will fixedly remain in position for scoring. The cutting blade **75***a* is caused to operate after the initiation of the pneumatic control **45** and through the downward movement of the sleeve-like rod **72**, the latter as discussed above, with highly versatile results being available because of the movement provided along the parallel rods **26** and **28**, the rotation of the support member **36** within the vertically extending member **30***d*, and the movement provided along the parallel rods **40** and **42**. Moreover, and as also indicated hereabove, the movement of the cutting mechanism **75** may be limited, as desired, by use of the various braking mechanisms, viz the disc **32**, the shoes **33***a* and the screw controlled system **50**.

Thus, it should be evident from the above that the applicant herein has provided a new and novel scoring machine which represents an optimum of versatility in scoring any given pattern in a material, and which, as well, permits such scoring to any pre-selected uniform depth. As should be further evident, the aforesaid uniformity is simply and readily achieved through the use of a new and novel adjustment mechanism also forming part of the instant invention. The aforedescribed scoring machine is susceptible to various changes within the spirit of the invention, including, of course, those of dimensioning and mechanical equivalents/expedients. Accordingly, the preceding discussion should be considered illustrative and not as limiting the scope of the following claims.

I claim:

1. A machine for cutting a uniform depth in an upholstery material comprising a framework, a work-receiving surface, and a cutting mechanism disposed on said framework and movable in planes generally parallel with said work-receiving surface and in a direction to and from said work, said cutting mechanism comprising a first hollow support member, a second hollow support member secured to said first hollow support member, spring means disposed within said first hollow support member and having an end thereof secured to a movable adjustment member, where said movable adjustment member extends through said second hollow support member and adjustably engages a portion of a third hollow support member, said third hollow support member being disposed in sleeve-like fashion with respect to said second hollow support member, and a cutting head disposed on said third hollow support member, where said spring means continually urged said cutting head in a direction away from said work-receiving surface.

2. The machine of claim 1 where a portion of said second hollow support member serves to limit the move-

ment of said adjustment member in the direction of said work-receiving surface.

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