Dec. 16, 1952 H. G. COOPER 2,621,415

CONTOUR TRANSFER DEVICE

Filed Oct. 11, 1949

FIG. 1.

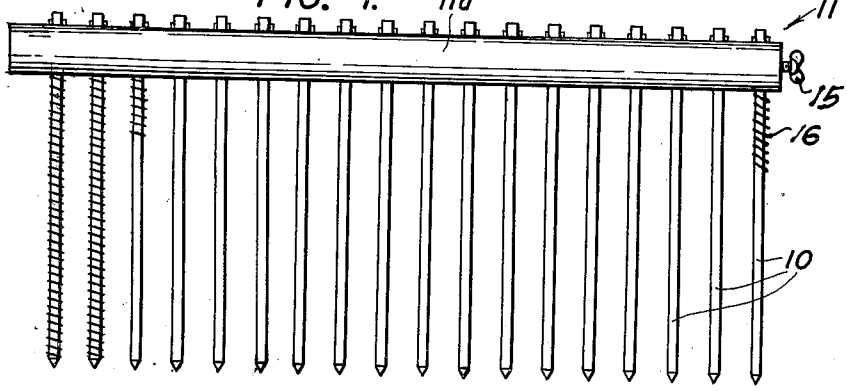


FIG. 3.

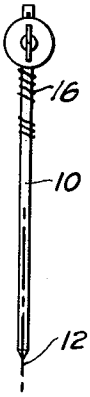
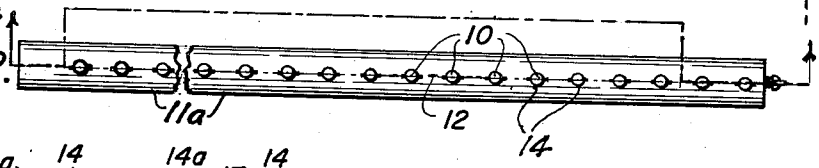


FIG. 2.



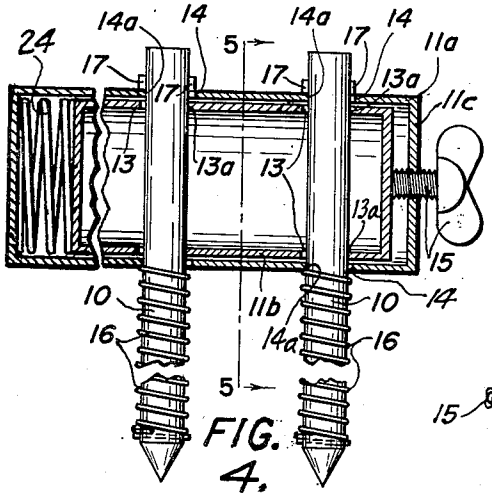


FIG. 4.

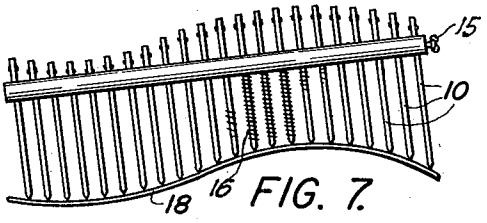


FIG. 7.

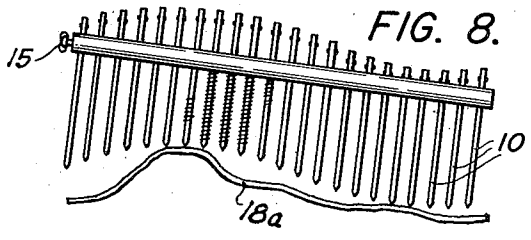


FIG. 8.

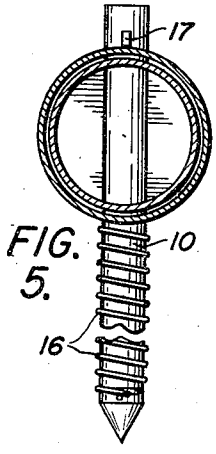


FIG. 5.

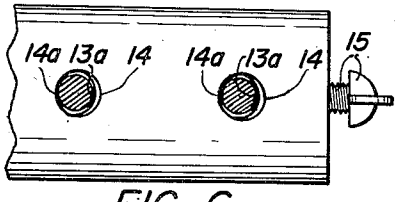


FIG. 6.

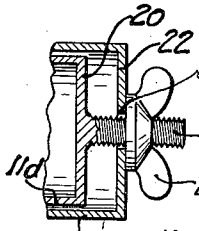


FIG. 9.

Inventor:
H. G. COOPER,
By C. H. Mallinckrodt
and Philip A. Mallinckrodt.
Attorneys.

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CONTOUR TRANSFER DEVICE

Homer G. Cooper, Cody, Wyo.

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1 Claim. (Cl. 33—175)

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This invention relates to contour transfer devices of the type wherein a plurality of spaced fingers or feelers are slidably mounted in a holder, the movement of the fingers being such that the tips thereof assume variable positions with respect to a common level, so as to conform to the contour of items whose shape is to be reproduced.

Devices of this type customarily provide a locking arrangement for the fingers, thereby making it possible to temporarily retain and appropriately transfer contours acquired from time to time in use.

The principal object of the present invention is to provide a contour transfer device of this type, whose construction and arrangement of parts is such that the fingers or feelers can be securely and simultaneously locked in place along a given contour. Other important objects are to provide a device which is simple, convenient and durable, as well as relatively inexpensive.

A common field of usefulness of this tool is in making a record of the contour of an irregular body such as an automobile fender so that this record can be used as a templet in forming duplicates of the contour of such irregular body.

In the accompanying drawing which illustrates a preferred embodiment of the invention:

Fig. 1 represents a front elevation;

Fig. 2, a top plan;

Fig. 3, an end elevation;

Fig. 4, a fragmentary longitudinal section taken on the line 4—4 in Fig. 2.

Fig. 5, a cross-section taken on the line 5—5 in Fig. 4;

Fig. 6, a top plan corresponding to Fig. 4;

Figs. 7 and 8, front elevations, drawn to a reduced scale, to show the method of using the tool; and

Fig. 9, an alternative arrangement of locking means.

Referring to the drawing: the numeral 10 denotes a feeler or finger of which any desired number are mounted side by side in a holder 11. The fingers are preferably arranged along a common axial plane represented in Figs. 2 and 3 by the line 12.

As illustrated, a plurality of feelers or fingers 10 are mounted in the holder 11, so that each finger is independently slidable in the holder. The holder consists preferably of an outer tubular member 11a and an inner tubular member 11b, the two tubular members being telescoped and having a slight longitudinal movement with respect to each other, along the axial plane 12. The outer tubular member has openings 14, each

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of which normally is in substantially exact axial alignment with a corresponding opening 13 in the inner tubular member. In the normal position, the fingers 10 are freely slidable through the openings 14 and 13.

By moving the tubular members 11a and 11b axially of each other to the proper slight degree, the fingers are collectively locked tightly in place. This simultaneous locking is accomplished as indicated in Figs. 4 and 6 where an edge 13a of each hole 13, is pressed tightly against the corresponding finger 10 to cause it to bear against an edge 14a of the corresponding opening 14. In the present illustration, the relative slight movement between the tubular members 11a and 11b is accomplished by a pressure-exerting device such as a screw 15, threaded, for example, in the head 11c of the outer tube 11a.

In using the device, the normal position of the fingers is such that the lower tips are disposed as shown, for example, in Fig. 1. Ordinarily, when the tool is held vertically, the fingers drop into the position of Fig. 1, by gravity, yet it is often desirable that a positive yielding force be applied to each finger, for example, by means of a helical compression spring such as is exemplified at 16. In either case, a key 17 is provided to limit the downward travel of each finger.

Assuming now that the screw 15 is loose so as to leave the fingers 10 free to move upwardly when pressure is applied to the lower tips. Upon application of the tool, for example, to an ordinary fender 18, Fig. 7, the consecutive fingers 10 will be moved into positions where the fingers collectively contact the curvature of the fender so that by tightening the screw 15, the tubes 11a and 11b are moved into the relative position where the fingers are locked in the respective positions of Fig. 7. Thus, a definite graphic record, determined and recorded by the lower extremities of the fingers, is made, for example, of the curved contour of a fender that is not distorted. This graphically recorded contour can then be applied to a crumpled or distorted fender 18a as illustrated in Fig. 8, whereupon the workman is enabled to bring the injured fender to substantially the exact contour of the one that is uninjured.

While the device of the invention is extensively used in the restoration of wrecked automobile fenders, many other uses will readily occur to those skilled in the arts to which the invention is applicable.

The substantially concentric, axial arrangement of the tubular elements, which are advantageously of circular cross-section, makes pos-

sible an economical, mechanically clean-cut construction of the invention that finds ready acceptance among users of tools of the class to which the invention belongs.

It is to be particularly observed that in the present device the clamping pressure for locking the fingers, is applied axially, that is to say, longitudinally of the supporting structure, instead of transversely, as has been common in devices of the prior art. Also, by spacing the fingers along the axial line of the tubular members of the holder, all the fingers are simultaneously locked in a positive and secure manner by a single operative movement of the pressure-applying member of the clamping assembly.

The all-inclusive axial locking or clamping action upon the fingers is particularly clear in Fig. 6, where the space between the points 13*a* and 14 represents the difference in diameters of the fingers 10 and the holes in the two telescoping tubes. This difference may be just sufficient to allow the fingers to slip freely through the respective holes in the unlocked or released position of the members. For convenience, the fingers are shown in cross-section in Fig. 6.

As an alternative of the construction of Fig. 4, that shown in Fig. 9 contemplates a screw 19 which is integral with the head 20 of inner tube 11*d*. The screw 19 passes freely through a hole 21 in the head 22 of outer tube 11*c* and is provided with a wing nut 23. By means of the wing nut 23, which bears against head 22, forcible axial motion is imparted to inner tube 11*d* in a direction opposite to that of inner tube 11*b* in Fig. 4.

In general, the locking effect upon the fingers, in both Figs. 4 and 9 is similar. However, in the case of the alternative construction of Fig. 9, the points of contact 13*a* and 14*a* of Fig. 4 would be located upon the respective opposite sides of the fingers, that is to say, would be reversed.

In Fig. 4 it is assumed that the screw 15 has been tightened, thereby clamping the fingers 10 between the two tubular members 11*a* and 11*b* as aforesaid. Now, when 15 is unscrewed, the fingers, unless means is provided to prevent it, drop, and hang loosely in holder 11. Such means, in the present instance, consists of a compression spring 24, Fig. 4, the tension of which reacts between the respective heads of tubular members 11*a* and 11*b*. This tension serves to cause the tubular member to grasp fingers 10 and to hold them frictionally the moment screw 15 is sufficiently loosened to allow the contacts between the respective tubular members and the fingers to be reversed from the contacting positions 13*a* and 14*a* illustrated in Fig. 4. It is to be understood that the clearance spaces 13 and 14 preferably are small enough so the reversal transition from one set of contacts to the other is substantially instantaneous. In the reversal of contacts as last above touched upon, the fingers are yieldingly held as soon as they come under the influence of the tension of spring 24, it being clear that this tension should be great enough to counteract the action of springs 16. When so yieldingly held, any desired further adjustment of an individual finger is easily accomplished by tapping it, for example, by means of an ordinary hammer.

The fragmentary showing of springs 16 in Figs. 1, 7 and 8, is a matter of convenience.

Obviously, the lower extremities of the fingers 10 may be pointed, rounded, fitted with rubber tips, or otherwise suitably fashioned, as may be suitable for different classes of work. However, such specific features form no part of the invention and therefore need not be illustrated.

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

I claim:

A contour transfer device extending longitudinally, comprising an outer annular casing having an inner annular surface; another annular casing which is inside the first-mentioned annular casing and having an outer annular surface in close contact with said inner annular surface; and a plurality of fingers slidable transversely through both said casings.

HOMER G. COOPER.

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