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P. MESNEL

GUIDEWAYS FOR SLIDING WINDOWS

Filed Aug. 2, 1939

Serial No.
287,893

2 Sheets-Sheet 1

Fig. 1.

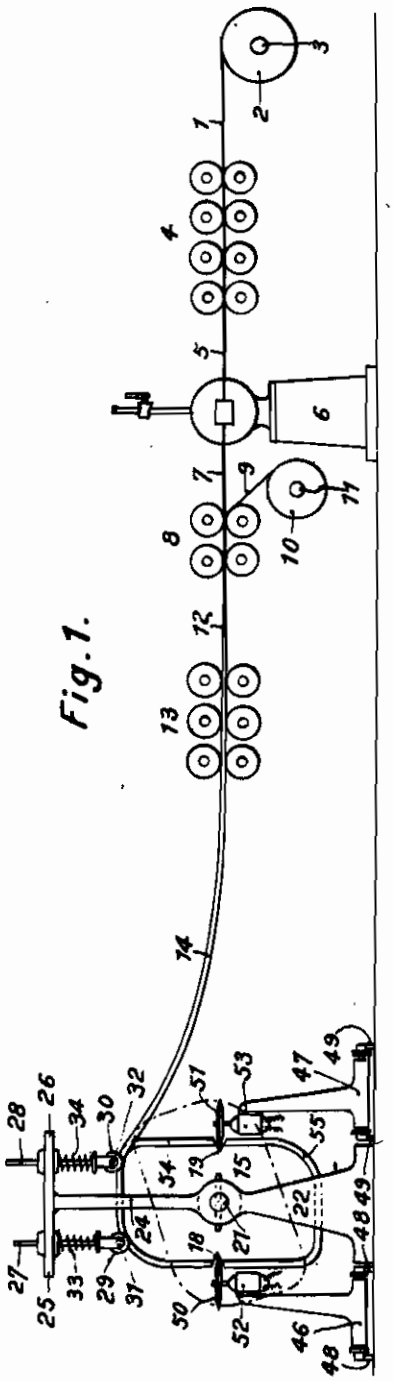

Fig. 2.

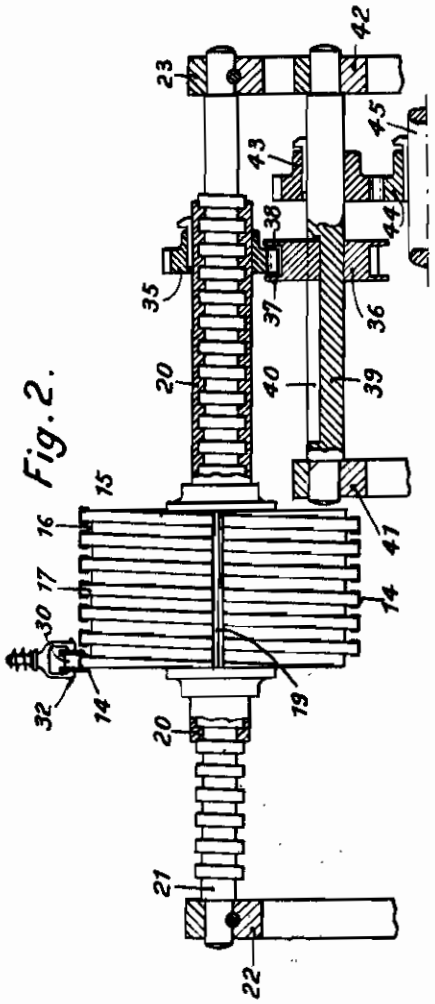

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Fig. 5.

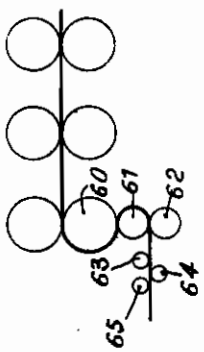


Fig. 7. Fig. 8. Fig. 9. Fig. 10. Fig. 11.

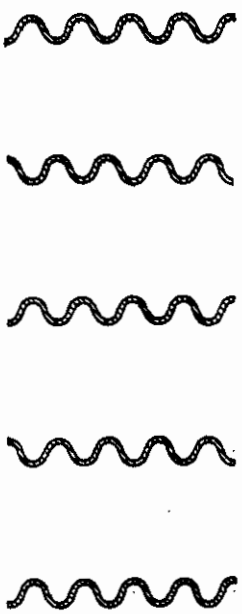


Fig. 3.

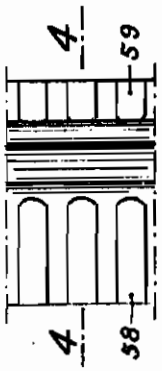
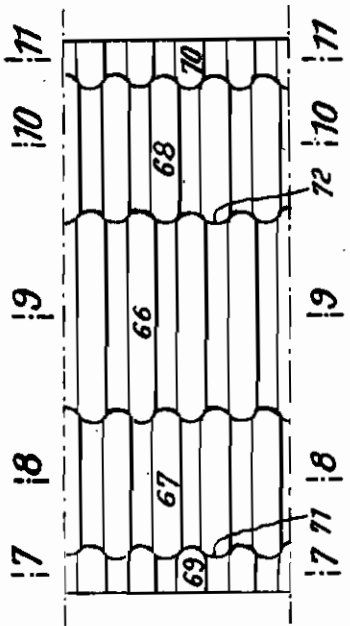


Fig. 4.

Fig. 6.



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ALIEN PROPERTY CUSTODIAN

GUIDEWAYS FOR SLIDING WINDOWS

Pierre Mesnel, Colombes, France; vested in the Alien Property Custodian

Application filed August 2, 1939

Hitherto guideways for sliding windows, in particular of automobiles, have been delivered to the manufacturer or to the body-maker in the shape of a more or less long, but generally straight strip. The operative who is entrusted with the mounting shapes said strip according to the contour of the window opening to be fitted, after having cut it to length, and then fixes it to the frame of the window opening. This mounting work requires a certain amount of skill on the part of the operative, particularly when it is required to fit window openings having a curved contour, like those of the so-called streamline modern automobiles.

In practice, it frequently occurs that instead of making the guideway accurately follow the rounded contour of the opening, the operative bends it too suddenly, so that angular bends are formed that are subsequently detrimental both to the correct sliding of the window and to the appearance of the body.

The present invention overcomes these drawbacks. It consists in manufacturing, in the factory, in their final shape, the guiding frames which are intended to be used to support windows, in particular of automobile vehicles, by winding a continuous strip of guideway on a drum whereof the cross-section is, at least over a portion thereof, shaped like the frames.

A multiplicity of such frames are thus obtained side by side on the drum, and it then suffices to separate them from the drum and cut them up in order to obtain the finished frames.

The invention also relates to the apparatus for manufacturing guiding frames for sliding windows according to this process, and which is characterized in particular by the following points, considered separately or in combination:

1. A resiliently mounted roller bears the guide strip against the drum as it reaches same;

2. The drum is provided with a helical rib, the cross-section of which is the conjugate of that of the guideway;

3. The pressure roller is a shaping roller which presses the faces of the guideway against the corresponding faces of the rib;

4. The cross-section of the drum is of the shape of two frames placed endwise, so that after the winding operation it suffices to effect two longitudinal cuts in order to remove the frames from the drum and cut them at the same time to length;

5. The cutting up is effected by means of wheels provided for the purpose and mounted on carriages that move longitudinally;

6. The drum is provided with longitudinal grooves, for relieving the wheels.

In the ensuing description, which is made by way of a non-limitative example, reference is had to the accompanying diagrammatical drawing. In said drawing:

Fig. 1 is a general view;

Fig. 2 is a view on a larger scale of the drum and of its immediately associated members, at 90° to the previous view, and with parts shown in section;

Fig. 3 shows an elevational view of the metal core of a contour ribbon;

Fig. 4 is a section along 4—4 of Fig. 3;

Fig. 5 is a diagram relating to a modification of the apparatus;

Fig. 6 is an elevational view of a solid metal core reinforcing a guideway treated by means of the apparatus according to Fig. 5;

Fig. 7 is a section along 7—7 of Fig. 6;

Fig. 8 is a section along 8—8 of Fig. 6;

Fig. 9 is a section along 9—9 of Fig. 6;

Fig. 10 is a section along 10—10 of Fig. 6;

Fig. 11 is a section along 11—11 of Fig. 6.

The thin metal strip 1, which forms the framework of the guideway, is obtained from a reel 2 rotatably mounted about a spindle 3. The metal strip 1 passes through a train of wheels 4 which effects the mechanical treatment thereof: cutting, marginal embossing, etc.

In the case of a relatively thick metal strip, one of the pairs of wheels may be used to form transverse slots in the central portion, in order to facilitate subsequently forming it into a channel.

The metal strip thus treated 5, then passes through a machine 6 which is known per se, for example a rubber moulding machine with a square head or a sizing machine.

The metal strip thus provided with a resilient material, 7, then passes through a second train of wheels 8 in which it is covered with felt or other textile material, 9, which is supplied by a reel 10 rotatably mounted about a spindle 11.

The strip 12 thus completely equipped passes through a train 13 of shaping wheels, or profiling machine, which give it a channel-shaped cross-section.

It is the guideway strip 14 which issues from the train 13 that is delivered such as it is, or after cutting to length if necessary, to the manufacturer or body-builder.

According to the invention, the guideway 14 which issues from the train of wheels 13, is conveyed towards a drum 15, the general transverse

sectional shape of which reproduces the shape of two guiding frames placed end to end, that it is desired to obtain.

On the surface 16 of the drum 15 is provided a projecting rib 17 which is the conjugate of the guideway. Two longitudinal grooves 18 and 19 intersect said rib along two diametrically opposite generatrices, so as to limit the shape of the frames to be obtained.

The drum 15 is carried by a hollow shaft 20 which is internally tapped and which is supported by a shaft 21 that is mounted and locked in supports 22 and 23. The shaft 21 is threaded to correspond with the tapping of the hollow shaft 20.

The support 22 is extended by an upright 24 from which issue two arms 25 and 26 through which pass rods 27 and 28 that terminate by rollers 29 and 30 rotatably mounted about pins 31 and 32. The cross-section of said rollers is such that they press the three faces of the channel-shaped guideway against the corresponding faces of the rib 17. Springs 33 and 34 constantly urge the rollers 29 and 30 against the surface of the drum 15. The arms 25 and 26 are so located that the rollers 29 and 30 press the guideway 14 against the rib 17 as soon as said guideway reaches the drum, as shown in Fig. 1.

On the shaft 20 is keyed a gear 35 which co-operates with a gear 36 which is provided with thrust cheeks 37 and 38 and which is driven by an intermediate shaft 39, but in such a manner as to be able to slide along the same by means of grooves such as 40. The shaft 39 is rotatably mounted in bearings 41 and 42 and is driven by means of a pinion 43 which is fixed on said shaft and which co-operates with a pinion 44 fast on a driving shaft 45.

Carriages 46 and 47 adapted to move on rails 48 and 49 are arranged longitudinally on either side of the drum 15. Said carriages carry cutting wheels 50 and 51 which are driven, for example, by electric motors 52 and 53 mounted on said carriages.

At the beginning of the work, the strip of guideway 14 is brought to the drum 15 and introduced into the space between the wheel 30 and the rib 17. The drum 15 being set in rotation, the strip is carried along, passes under the wheel 29 and winds round the drum. If necessary, its free end may moreover be fixed to the drum. As the rotation of the drum continues, the strip of guideway 14 continues to wind helically, the drum 15 simultaneously moving in the longitudinal direction owing to its screw and nut mounting, so that the input conditions of the strip 14 on the drum always remain the same. During this phase, of course, the carriages 46 and 47 have been moved along their rails so as not to hinder the rotation of the drum 15.

When the drum 15 is completely covered, the rotation is stopped in the position shown in full lines in Fig. 1, so that the longitudinal grooves 18 and 19 are in register with the wheels 50 and 51. Said wheels are set in rotation by the electric motors 52 and 53 and the carriages 46 and 47 are moved slowly, so that the strip of guideway which is wound on the drum is cut into two series 54 and 55 of finished guiding frames, that it suffices to remove from the drum 15.

It should be observed that the forcing of the guideway 14 under pressure against the rib 17 enables a ribbon 9 made of cloth to be used which, if desired, is not cut diagonally but in the direction of the threads.

The invention is not strictly limited to guideways for sliding windows proper, but also extends to the adjacent article called contour ribbon or water-tight joint, which is used for holding and guiding the sliding windows of automobiles. Two of such contour ribbons, arranged parallel, perform the same function as a guideway of channel-shaped cross-section. In addition to guiding windows, such ribbons may be used for guiding by sliding panels made of sheet metal, wood or the like, for example what are known as opening roofs in the art of automobile body building. The surface 16 of the drum is in this case provided with a helical groove of which the shape corresponds to said ribbon and in which same is lodged by the action of one or a plurality of rollers of appropriate shape.

This metal core is obtained from a plane metal strip or ribbon on which are formed longitudinal folds or beadings, two in the example shown, which are directed obliquely in the figure. In a modification, said folds could moreover be perpendicular to the folds of the metal strip. In any case, said folds are advantageously juxtaposed to each other in a contiguous manner. The marginal bands 58 and 59 are embossed, that is to say that they are provided with transversely extending corrugations.

A contour ribbon provided with a metal core according to the invention is remarkable, in particular, by the ease with which it can be compressed, even by hand, to follow the most varied contours, the radii of curvature of which may be very small. The corrugated marginal bands impart to it considerable flexibility and, in combination, the intermediate folds or beadings prevent any untimely bending or twisting of the ribbon. The contiguous position of the beadings enables the ribbon to be mounted accurately and quickly without the shaping of the ribbon substantially modifying the relative positions of the beadings which may be considered to be secured to each other and determine the general shape of the ribbon as a whole.

The presence of the folds or beadings imparts to the ribbon the property of retaining its shape, so that, for example, when it has been shaped, it suffices to fix it at a few points in order to secure it sufficiently to the surface to which it is fitted.

In a modification, the metal core is simply provided, on the one hand with one or a plurality of juxtaposed folds, and on the other hand with a single corrugated band bordering one of the sides of the fold or folds.

A particularly advantageous metal core for reinforcing such a ribbon is shown in elevation in Fig. 3 and in section in Fig. 4. It is obtained from a metal strip on which are erected two juxtaposed beadings 56 and 57, the longitudinal bands 58 and 59, on either side of said beadings, being milled.

It has been found that the guiding frames manufactured according to the invention have a certain degree of flexibility at their rounded corners, whereas their straight portions retain the same degree of rigidity as the initial guideway. Said frames can therefore be readily fitted by hand to window openings whereof the contour is not exactly that for which they were intended and which differ by the relative angles of their straight portions.

Starting from this remark, the invention also provides for the modification of manufacture of guideways for sliding windows according to which, after having been given its final cross section, for example U-shaped, the guideway is systematically deformed in such a manner as have angles at close intervals, for example in the shape of a close sinusoid, and is then straightened, out to rectilinear shape.

In the embodiment shown in Fig. 5, the guideway issuing from the train **13** is fed along a sinusoidal path by the co-operation of forming wheels **60**, **61**, the first also acting as a finishing wheel for the train **13**, and of the pressure roller **62**. The bent guideway is immediately straightened by the action of three straightening rollers **63**, **64** and **65**.

The guideway thus obtained, which has the appearance of a usual straight guideway, is however distinguished therefrom by the following essential point: owing to the molecular work undergone by the metal during the deformation of the guideway, for example into a close sinusoid, the final guideway can be readily deformed by hand to fit the contours of the window openings.

Such a process enables the simplest possible form of channel section metal core to be used, that is, to say having continuous faces without slots or perforations and which are substantially plane, that is to say without corrugations, and in which there are no special means that were hitherto provided for imparting the necessary flexibility, and which nevertheless has sufficient flexibility for a large number of uses.

In this connection, the invention enables use to be made of guideways having a continuous metal core, that is to say which is not cut out, which had to be given up for equipping modern automobiles, owing to their rigidity. A guideway provided with a continuous core which, according to the invention, has been subjected to the above treatment, has a similar flexibility to that of guideways provided with a cut out core and can advantageously replace same.

Fig. 5 shows diagrammatically an elevational view of a continuous core that is suitable to be used, and Figs. 7 to 11 show sections of same. Said core is simply obtained from a metal strip on which have been formed a central milling **66**, two lateral millings **67** and **68** and two marginal millings **69** and **70**. Said milling can be obtained in a single operation, by passing between two rollers of corresponding shape. The channel cross-section is obtained by folding along the lines **71** and **72** separating the central milling from the lateral millings. The marginal millings **69** and **70** impart the necessary stability of shape to the finished flexible guideway.

In a modification, the core is provided in combination, with plane portions and embossed portions.

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