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Cummins

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[54] AUTOMOBILE WINDSHIELD AND BACKGLASS REMOVAL TOOL

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[52] **U.S. Cl.** .....**219/221**, 30/116, 30/140, 83/16, 143/133 D, 219/233, 219/240

[51] **Int. Cl.** **H05b 1/00**, B26d 7/10

[58] **Field of Search**.....219/221, 223, 227, 233, 234; 30/140, 115, 116, 117; 83/170, 171, 15, 16; 128/303.14; 81/9.5 R, 9.5 B; 143/133 R, 133 D; 145/31 R

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[57] **ABSTRACT**

A tool for cutting an adhesive sealant of the type used for sealing automobile windshields and backglasses. An electrically heated music wire is employed for cutting the sealant. The cutting wire is held by and positioned between the outer ends of a pair of electrically conducting metallic shanks. The inner ends of the shanks are inserted into a pair of nonconducting handles which may be held by the hands while using the tool. Electrical leads are electrically connected to the outer ends of the shanks at points remote from the handles whereby current does not pass through the inner ends of the shanks. A variable resistance is used to control the amount of electrical current flowing through the cutting wire.

4 Claims, 2 Drawing Figures

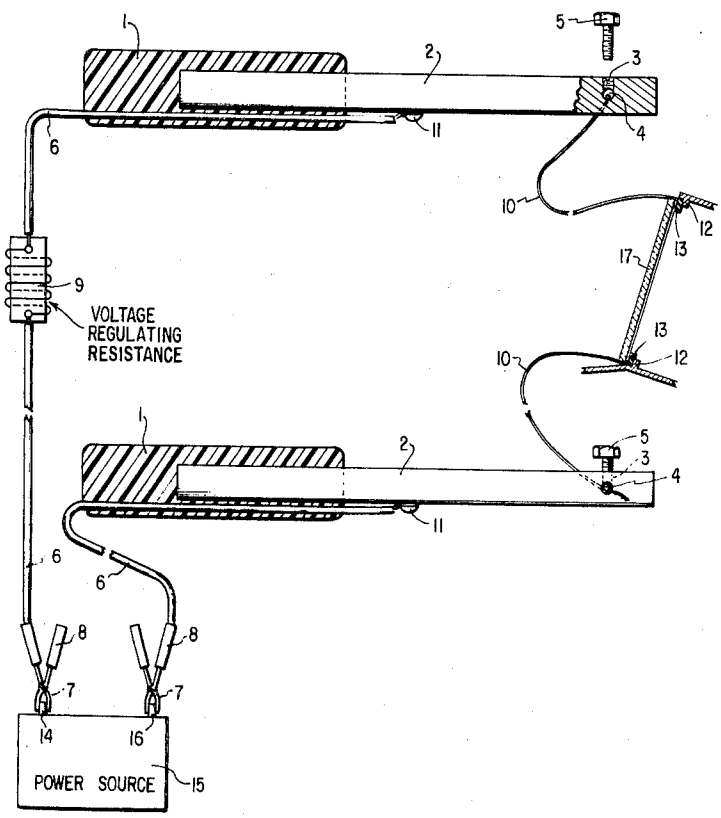
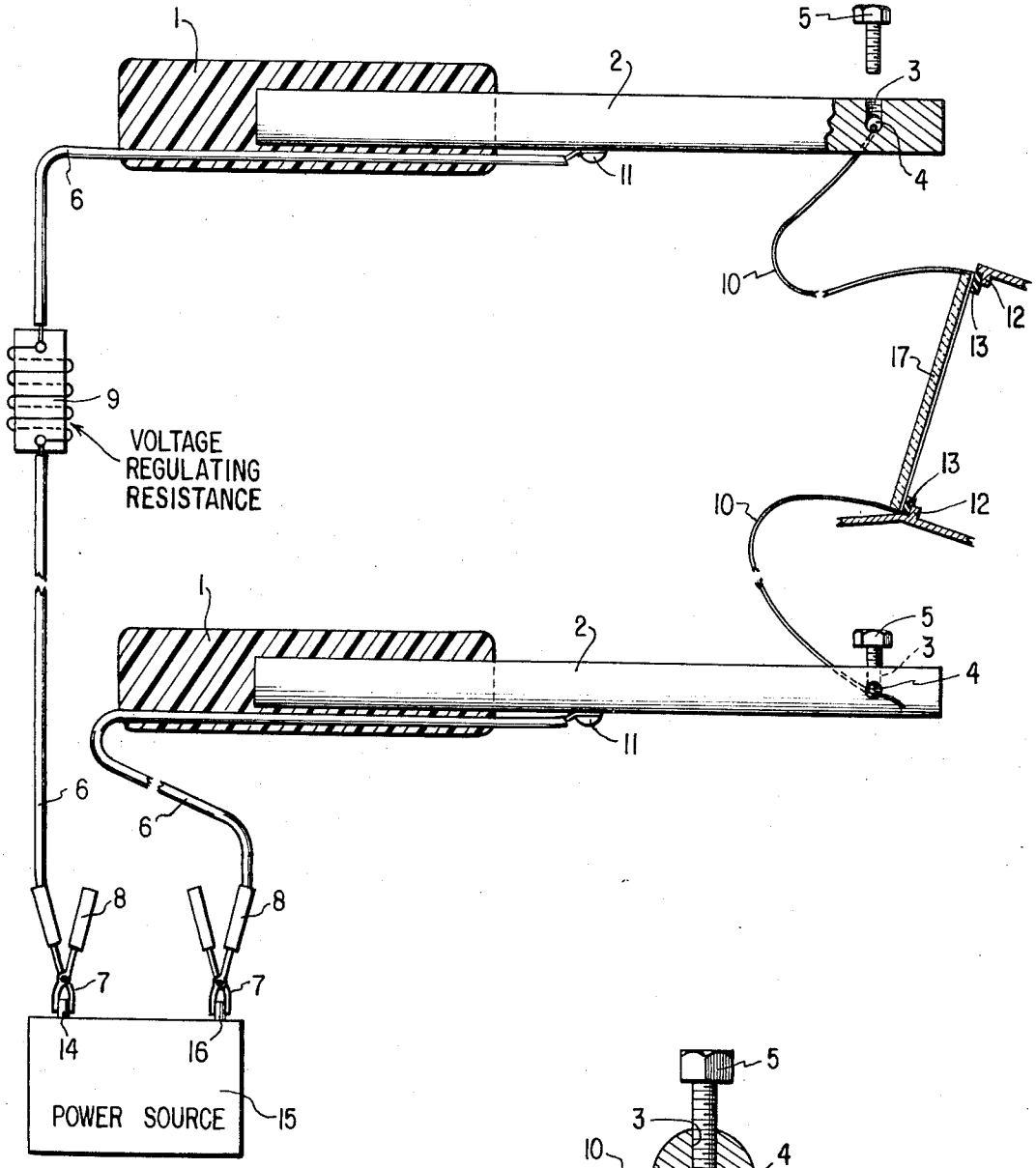


FIG. 1


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
VOLTAGE REGULATING RESISTANCE
POWER SOURCE

5
3
10
4
2

FIG. 2

AUTOMOBILE WINDSHIELD AND BACKGLASS REMOVAL TOOL

BACKGROUND OF THE INVENTION

Most automotive manufacturers now use in most passenger models an adhesive type of sealant for the installation of the windshield and backglass. The glass is held in pace by means of a butyl rubber tape or polysulfide type of adhesive sealant. These types of sealants are an effective means for holding the glass on a flexible base and maintaining a continuous seal to the metal and glass sides regardless of tensions put on the sealers during driving conditions. These materials must be cut to remove the glass and the thickness of the sealer varies as does the hardness of the sealers (butyl is softer than polysulfide). To my knowledge, tools that are now available include cold knives, hot knives, and cold music wire to cut the sealers. These tools do the job with varying degrees of efficiency.

The present invention provides a tool and method for removal of an automotive windshield or backglass which requires only one person regardless of the thickness or hardness of the adhesive type of sealant. This is assured by two features of the invention. One feature is that the music wire (approximately 0.020 diameter) is small enough to allow passage through even the thinest bed of an adhesive type of sealant. The second feature is that a constant power source to the music wire assures easy cutting of the adhesive type of sealant thereby decreasing the physical effort and time required to pull the music wire through the sealer. There are many windshields and backglasses mounted on a sealer base which is too thin to accomodate the thickness of the cold and hot knife blades now available. Also, a cold music wire is brittle and subject to breaking and requires more physical effort and time to cut through the sealer.

SUMMARY OF THE INVENTION

In accordance with the present invention, an improved electrically heated tool is provided for cutting an adhesive sealant used for sealing automobile windshields and backglasses. The improved tool includes an electrically heated music wire which extends between the outer ends of electrically conducting shanks. The inner ends of the shanks are positioned in nonconducting handles which may be held by the hands. Electrical leads are connected to the outer ends of the shanks thereby preventing current from passing through the inner ends of the shanks during use. The electrical current to the heated wire is controlled by means of a variable resistance.

An object of my invention is to provide a tool that may be operated by one person with minimum effort and in a minimum period of time and which assures the operator of removal of windshield and backglass where other prior art tools may fail.

Another object of my invention is to provide a windshield and backglass removal tool and method which, due to it's smooth cut may require less sealer for rebonding and sealing purposes when a replacement glass is installed.

It is still another object of my invention to provide an adhesive sealant cutting tool which is capable of withstanding the pressure and heat applied in cutting an adhesive sealant regardless of whether the sealer is the softer butyl tape type or the harder polysulfide type.

It is another object of my invention to provide such a tool which is of simple construction, easy to use, economical to use and economical to manufacture.

Other objects of my invention will become apparent from my drawings and the following specification.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a diagramatic side view which is partially in section and with portions broken away to better illustrate the invention; and

FIG. **2** is a sectional view illustrating the manner of securely retaining the ends of the cutting wire in the metal shanks.

DETAILED DESCRIPTION OF THE INVENTION

My glass removal tool comprises two holders, each having a Bakelite type plastic handle **1** of greater diameter than metal shank **2** which may be integral therewith. Each metal shank **2** has a drilled hole **4** extending transversely through the metal shank **2**. Each metal shank **2** also has a vertically extending threaded hole **3** drilled through the radius of the shank into the threaded hole **3**. A threaded bolt **5** of the same diameter and threads is inserted into the threaded hole **3**. The threaded bolt **5** has a flat head to allow tightening with a pair of pliers. A standard insulated stranded 12 or 14 gauge electrical copper wire **6** is connected to each metal shank **2** by soldering **11** and then insulated. To the other end of each electrical wire **6** is attached an alligator clamp **7** having an insulated handle **8** to facilitate connecting to a standard twelve volt automotive battery **15** which is contained in vehicles with the adhesive type sealant **13** for windshield or backglass **17**. Since the direct current of the twelve volt automotive battery **15** is too hot for the small gauge cutting wire **10** used as the cutting means, it is necessary to include a voltage regulating resistance **9** in the circuit of one holder. The circuit containing the voltage regulating resistance **9** should be connected to the hot or power side **14** of the battery **15**. The cutting wire **10** is a standard spring steel music wire approximately 0.020 inch in diameter.

One method of using the tool is as follows:

Step 1: Take approximately 3 feet of wire **10** (about 0.020 inch in diameter) and, with outside trim moldings previously removed, go to the passenger side of the front seat of the vehicle. From the outside, force one end of the wire **10** through the sealer **13** using a pair of needle nose pliers. When enough wire **10** is available on the inside of the vehicle to enable grasping the wire end with the pliers, pull through enough wire **10** to feed the same end back through sealer **13** at the top edge of the windshield or backglass **17** from the inside of the vehicle. Then go to the outside of the vehicle and grasp the end of the wire **10** with the pliers and pull out about 6 to 8 inches thereof. The operator will then have the two ends of the three foot wire **10** on the outside of the vehicle with the wire **10** laying against the inside edges of the auto glass **17** at the bottom and top thereof.

Step 2: The operator now inserts one end of wire **10** through unthreaded hole **4** and tightens the threaded bolt **5** until the wire is clamped securely.

Step 3: Repeat step **2** for the other end of the wire **10**.

Step 4: The operator then takes the two alligator clamps **7** and connects them to the appropriate terminals of the battery **15** (the red coded clamp to the bigger power post **14** and the black coded clamp to the smaller post **16**). These connections will immediately activate the wire **10** with heat. A voltage regulating resistance **9** is included in one circuit of the tool so that the wire **10** will not become too hot and fuse.

Step 5: The operator is now ready to begin the cutting procedure. One holder is held steady and the second holder is pulled while giving some slack with the steady holder until the hands are in somewhat of a diagonal position. Both holders are then moved applying a pull or push type of pressure along with a slight sawing motion. This procedure is continued until one side portion of the auto glass is reached. Hot wire **10** is worked around one corner of the glass, and then the other end of the hot wire **10** is worked around the other corner of the glass. The operator cuts the sealer **13** down one side by pulling one or both holders toward each other until all of the sealer **13** is cut. This completes the cut across the top and bottom edge and down one side of the glass.

Step 6: The operator raises the side portion of the auto glass **17** which has been cut free. The hot wire **10** is inserted back under the inside edge of glass **17** with one end of wire **10** and one holder at the top edge and the other end of wire **10** and the other holder at the bottom edge. The holders and hot wire **10** are then worked back across to the passenger side of the front seat, which is the starting point of the initial cut. This puts the operator in a position to cut the sealer on the opposite side. The same procedure outlined in step **5** is followed for the second side portion of the glass **17**. The tool is then disconnected from battery **15** and the wire **10** immediately cools. With the completion of the above steps, the windshield or backglass is completely sheared from the sealer **13** and is ready for removal from the auto body opening **12**.

I have described my invention and one intended method of using the same. However, many changes and modifications may be made therein without departing from the invention.

I claim:

1. A tool for cutting an adhesive sealant of the type used for sealing automobile windshields and backglasses comprising first and second elongated electrically conducting metal shanks, each of said first and second shanks having a first end portion at one end and a second end portion at the other end, first and second non-electrically conducting handles, the said first handle having an elongated recess formed therein for receiving the first end portion of the said first shank, the said second handle having an elongated recess formed therein for receiving the first end portion of the said second shank, the said first end portions of the first and second shanks being secured respectively in the elongated recesses formed in the first and second handles whereby the said second end portions extend outwardly therefrom, an electrically resistive metallic cutting wire, means carried by each of the said second end portions of the first and second shanks for retaining the cutting wire, the means for retaining the cutting wire including first and second openings in each of the said second end portions of the said first and second shanks, the first openings extending through the shanks in a direction generally transverse to the longitudinal axis thereof and being of a size to receive the ends of the cutting wire, the second openings extending generally transverse to the longitudinal axis of the shanks and approximately 90° to the first openings and intersecting the first openings, the ends of the cutting wire being positioned in the first openings, each of the second openings being threaded to receive a set screw, and a set screw in each of the second openings in threaded engagement with the threads thereof and tightened whereby the ends of the set screws tightly engage the ends of the cutting wire and thereby retain the ends of the cutting wire securely in place, the cutting wire having an electrical resistance whereby it is heated to an elevated cutting temperature upon passing electric current therethrough, first and second electrical leads having first and second end portions, the first and second electrical leads passing through the said first and second handles respectively whereby they are retained in proper positions thereby, the first end portions of said first and second electrical leads being electrically connected respectively to the first and second shanks at points remote from said first and second handles whereby electric current does not pass through said first end portions of the first and second shanks, means carried by each of the second end portions of the first and second electrical leads for electrically connecting the same to a source of electrical power, and a voltage reducing resistance means in the electric circuit formed by said first and second electrical leads, second end portions of the first and second shanks and cutting wire for varying the amount of electric current flowing through the said cutting wire when the tool is in use.

2. The tool of claim **1** wherein the cutting wire is spring steel music wire having a diameter of about 0.020 inch.

3. The tool of claim **1** wherein said voltage reducing resistance is provided in at least one of said first and second electrical leads.

4. The tool of claim **1** wherein the said means carried by the second end portions of the first and second electrical leads for electrically connecting the same to the source of electrical power includes alligator clips.

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