Oct. 26, 1965 H. P. KEIRN 3,214,210

TUBE HANDLER

Filed Jan. 30, 1963

Fig. 1.

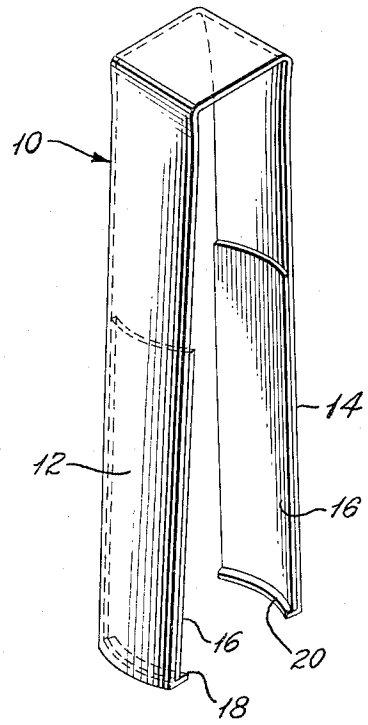


Fig. 2.

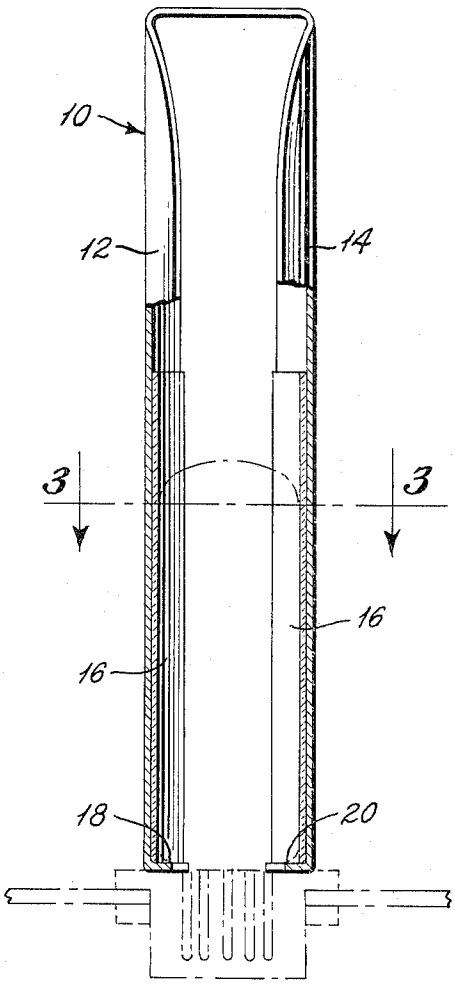
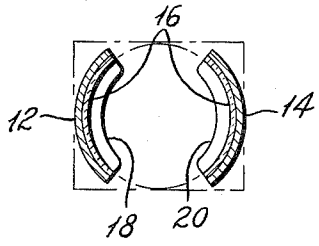


Fig. 3.



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TUBE HANDLER

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This invention relates generally to a tube handler and more specifically to a tool for removing or inserting electronic tubes such as are used in radio, television, and various computing machines.

There have been endeavors in the past to provide implements to facilitate the removal and insertion of electronic tubes. Heretofore, these devices have been rather complicated in structure and somewhat limited in use in that the tools require considerable space in order to be manipulated properly. Further, the cost of production of such tools has caused them to be expensive to buy and many men in the trade can not afford the luxury of owning one.

A further disadvantage of some of the known devices is that great care must be exercised in the amount of force exerted on the tool to avoid breaking the tube. Also, some tools can be utilized in the handling of, say a glass tube, but they will not grip sufficiently the metal casing type tubes.

It is, therefore, an object of this invention to provide a tube handler which overcomes the above disadvantages.

It is a further object of this invention to provide a tube handler which may be manipulated in small places.

It is still a further advantage of this invention to provide a tube handler which has means for insulating the tube from the tool surface which is to be grasped by the user.

It is still a further object of this invention to provide a tube handler which may be utilized for all kinds of electronic tubes and for both removal and insertion of the tubes.

These and other objects of the invention may be accomplished by one embodiment in which the tool comprises a substantially U-shaped body having diverging extending legs. The body is formed of a resilient material so that the legs may be moved toward each other by the user, but when released, they will spring outwardly away from each other. The inner face of each leg is concave in cross-section so as to conform with the generally cylindrical form of a tube. Means are provided on each leg to provide for a better gripping action of the leg with the tube surface and also to act as a heat insulator. At the free end of each leg there is provided a laterally inwardly extending flange which is intended to be inserted beneath the bottom of the tub to assist in the removal of the tube.

This embodiment is illustrated in the accompanying drawings in which:

FIG. 1 is a perspective side view of the tube handler;

FIG. 2 is a side elevational view, partially in section in position adjacent a tube drawn in broken lines; and

FIG. 3 is a sectional view taken on line 3 of FIG. 2.

The tube handler **10** comprises a substantially U-shaped member having depending legs **12** and **14**. The tube handler **10**, in the preferred embodiment, is formed of suitable light weight metal by stamping or other suitable methods. The metal or other material used in forming the tube handler **10** should be of sufficient rigidity so that when formed into the configuration of the preferred embodiment, each of the legs **12** and **14** may be pressed toward each other and when released will have a tendency to spring outwardly away from each other without any deformation of the desired shape of the tube handler. Each of the legs **12** and **14** are substantially concave in cross-section, which serves a two-fold purpose. The concave cross-sectional shape of the leg increases the rigidity of the leg and also conforms approximately to the cylindrical shape of the tube which is to be handled.

An elongated strip **16** of rubber, asbestos, or other suitable material having good insulation qualities and high frictional qualities is secured by means of suitable adhesive to the inner concave surface of the legs **12** and **14**, adjacent the lower portion thereof and extending to the end thereof. The strips **16** provide a surface which will frictionally grip the article to be handled and, in the event the tube is hot, the strips will provide an insulating layer between the hot tube and the metal legs **12** and **14** which are engaged by the user of the tool.

At the free end of each of the legs **12** and **14** there is provided an inwardly extending flange **18** and **20** respectively. The flanges **18** and **20** extend a short distance inwardly from the inner surface of the legs **12** and **14** and assist in maintaining the pad **16** on the legs. The flanges **18** and **20** may be wedged beneath the bottom of the tube to provide a better grip on the tube when it is to be removed from the socket, if necessary.

The over-all length of the tube handler **10** is intended not to exceed substantially the length of the longest tube likely to be encountered. The small size of the tube handler facilitates use of the device in areas which are difficult to reach. The tube handler **10** is shown in FIG. 2 in position over a tube with the flanges **18** and **20** inserted beneath the tube ready to remove the tube from its socket. It is to be noted that the strips **16** are disposed between the surface of the tube and the legs **12** and **14** so that the user will not burn his fingers when he removes a hot tube.

The tube handler **10** is also very useful in inserting tubes. The pads **16** will grip the surface of the tube and will hold the tube firmly within the tube handler while the flanges **18** and **20** aid in positioning the tube in the tube handler **10**. The tube may be placed on one leg with its bottom abutting the flanges on one of the legs. The user may then exert pressure on both legs, thereby bringing the other leg into engagement with the tube.

The tube handler **10** is very useful in many places which are inaccessible to presently known devices. The present day car radios are usually placed up beneath the dash board and are very difficult to reach to replace tubes. It is sometimes impossible for a service man to reach the tube with his fingers to remove it for replacement. The tube holder **10**, being very slender and not much larger than the tube itself, may be slid into the radio cabinet to place the tube into a socket, or in like fashion to remove a tube thereform.

Also, with the great demand for reduction in size of television sets and with the advent of printed circuits enabling such a drastic reduction in size, it is often necessary to disassemble completely the chassis of the set to be worked on because of the inaccessibility to the tubes. This device provides means to obviate the necessity of all of this labor and easily remove and replace tubes.

The simplicity of construction of this invention lends itself to be manufactured economically.

While the invention has been set forth in a certain embodiment above, it is recognized that certain variations and changes may be made without departing from the invention as set forth in the claims below.

I claim:

1. A tube handler for gripping electronic tubes, said handler comprising:

an upper portion having opposite sides;

a pair of opposed, elongated resilient legs, an upper end of each leg being fixedly connected to one of said opposite sides of said upper portion;

each of said legs having arcuate inner and outer surfaces and a central longitudinal axis which is straight

throughout its length, said legs being resiliently urged away from each other;

an elongated strip of insulation material having arcuate inner and outer surfaces fixedly positioned on said arcuate inner surface of each of said legs;

said elongated strips extending from a lower end of each of said legs throughout a majority of the length thereof;

a horizontally extending, inwardly projecting flange fixed to said arcuate inner surface of each of said legs at said lower end thereof, said flanges having an arcuate inner surface adapted to be wedged under the base of a tube when the tube is in its socket.

2. A tube handler for gripping electronic tubes, said handler including a flattened upper portion;

a pair of opposed, elongated resilient legs the upper ends of which are fixedly connected in a perpendicular relationship with opposite ends of said flattened upper portion;

each of said legs having arcuate inner and outer surfaces and a central longitudinal axis which is straight throughout its length, said legs being resiliently urged away from each other;

an elongated strip of heat insulation material having arcuate inner and outer surfaces fixedly positioned on said arcuate inner surface of each of said legs;

said elongated strips extending from adjacent a lower end of each of said legs throughout a majority of the length thereof;

a horizontally extending, inwardly projecting flange fixed to said arcuate inner surface of each of said legs at said lower end thereof, said flanges having an arcuate inner surface adapted to be wedged under the base of a tube when the tube is in its socket.

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