March 5, 1957 A. L. WILSON 2,783,667

ELECTRONIC TUBE PULLER AND REPLACER

Filed Aug. 3, 1953

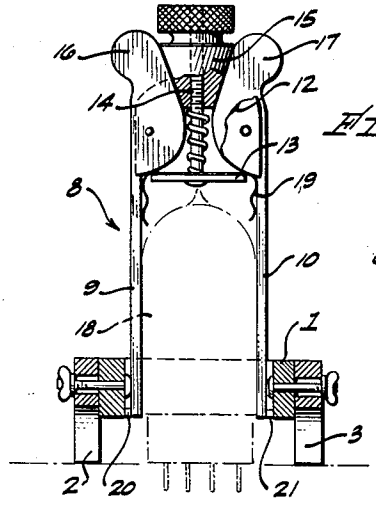



FIG. 2.

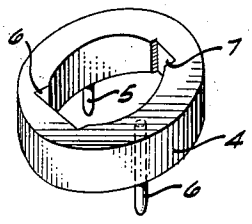



FIG. 4.

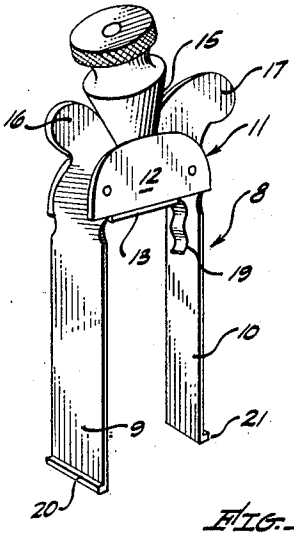



FIG. 1.

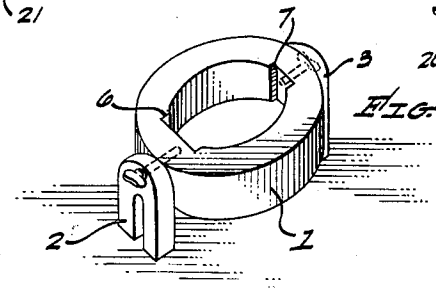



FIG. 3.

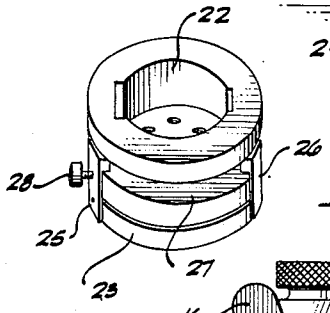



FIG. 5.

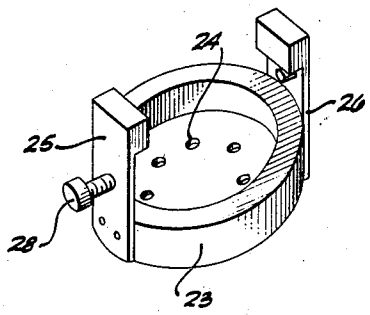



FIG. 7.

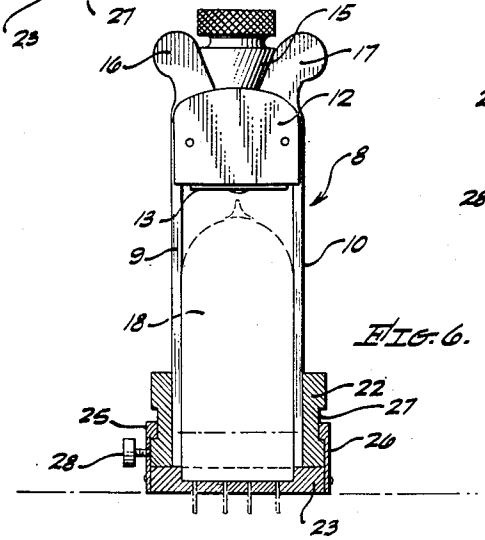



FIG. 6.

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# ELECTRONIC TUBE PULLER AND REPLACER

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7 Claims. (Cl. 81—3)

This invention relates to an electronic tube puller and replacer whereby a repair man can easily remove an electronic tube from a radio or television set, and in removing this tube it is so indexed that it can easily be replaced by the repair man without devoting a great deal of time to hunt the required position of the contact pins or prongs of the tube in its socket.

An object of my invention is to provide a novel electronic tube puller and replacer in which a ring is mounted on the chassis or socket in such a way that it cannot be easily disturbed, that is, it cannot be easily rotated out of its initial position on the chassis or socket. The tube engaging remover is indexed relative to the ring so that this remover can be readily returned to the position in which it originally removed the electronic tube from the set.

Another object of my invention is to provide a device of the character stated in which the ring is mounted on the chassis or the socket by means of magnets, and the tube puller is provided with a pair of arms, these arms in turn being indexed relative to the ring so that the arms will enter the ring in only one position.

A feature of my invention resides in the novel means whereby the ring can be removed by the tube puller after the electronic tube has been replaced in the set.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description and the appended claims.

In the drawing:

Figure 1 is a perspective view of the electronic tube puller.

Figure 2 is a transverse sectional view of the ring and showing the tube puller in position to remove an electronic tube.

Figure 3 is a perspective view of the ring.

Figure 4 is a perspective view of a modified form of the ring.

Figure 5 is a perspective view of a tube indexing device.

Figure 6 is a transverse sectional view of the tube indexing device and showing the tube puller positioned therein.

Figure 7 is a perspective view of the socket portion of the tube indexing device.

Referring more particularly to the drawing, television and radio sets are provided with either a metallic chassis in which the various tube sockets are mounted or the upper surface of the socket itself is metallic. My electronic tube puller and replacer consists of a ring **1** which is mounted on the chassis or on the socket in a relatively fixed position by means of the magnets **2** and **3**. The magnets **2—3** engage either the chassis or the socket in the chassis and, consequently, hold the ring **1** so that it cannot be readily disturbed from the position in which it is initially placed. As an alternative, a ring **4**, similar to the ring **3**, can be mounted in the chassis by means of downwardly projecting prongs **5—6** which enter appropriate holes in the chassis or socket, thus non-rotatably



holding the ring **4** in position and again permitting the electronic tube to be properly replaced, as will be subsequently described. The ring **1** is provided with two vertical grooves **6** and **7** which are diametrically opposed, the one groove **6** being materially wider than the groove **7** so that the tube puller and replacer, to be subsequently described, will fit into the ring **1** in only one position.

The tube puller and replacer **8** consists of a pair of prongs or arms **9** and **10**, the arm **9** is wider than the arm **10** and the arm **9** fits into the groove **6**, while the arm **10** fits into the groove **7** of the ring **1**. The arms **9** and **10** are pivotally mounted in a head **11**, which consists of two side plates **12—12**. The head **11** also includes a base **13** which extends horizontally between the plates **12—12**. A threaded pin **14** rises from the base **13** and a cone **15** screws onto this pin. The cone **15** engages the upper ends **16—17** of the arms **9—10**, respectively, for the purpose of pressing the arms **9** and **10** inwardly against the electronic tube **18**, for the purpose of removing and replacing this electronic tube from the radio or television set. A spring **19** engages the arms **9—10** for the purpose of pressing these arms outwardly when the cone **15** is threaded upwardly on the pin **14**. The purpose of this spreading action being to engage outwardly projecting ribs **20—21** on the arms **9—10**, respectively, these projections or ribs engaging the bottom of the ring **1** so that this ring can be readily retrieved after the electronic tube has been replaced in the set.

As thus far described, it is assumed that the same tube is replaced in the set as was removed therefrom. However, if it is found that the tube is defective and a new tube must be inserted in the set, I then provide an orienting or indexing device as follows: A ring **22** similar in arrangement and construction to the ring **1**, except that no magnets or pins are mounted thereon. A simulated tube socket **23** which has the same holes **24** therein to receive the prongs of the electronic tube as the real socket in the set, the socket **23** is provided with arms **25—26**, the upper ends of which fit into the annular groove **27** in the ring **22**. A set screw **28** in one of the arms **25** or **26** engages the ring **22** for the purpose of holding the socket **23** against rotation.

In operation the ring **1** or **4** is first mounted on the chassis or tube socket and is held in fixed position by means of the magnets **2—3**, or by means of the pins **5—6**. The puller **8** is now placed over the tube **18** and is oriented relative to the ring **1** because the arm **9** can only fit into the slot **6** of the ring **1**. The arms **9** and **10** are now pressed inwardly against the tube **18** by screwing the cone **15** downwardly. Once the tube **18** has been gripped it can be pulled upwardly by the puller **8** and removed from the set without disturbing the ring **1**. The tube **18** is now checked in the usual repair man's checker. If the tube is found to be in proper working order, it is returned to the set and can be easily replaced in its socket, since the puller **8** is indexed relative to the ring **1** and the ring **1** has thus far not been disturbed. After the tube **18** is replaced, the ring **1** is removed from the set by spreading the arms **9—10** outwardly so that the ribs **20—21** engage the bottom of the ring and permit it to be pulled upwardly.

It is understood that the tubes **18** are the very small electronic tubes in common use, and in large sets these tubes are placed very close together and also in very inaccessible places so that the repairman can frequently not see the socket in which the tube is to be placed. If the tube **18** is found to be defective, it is still held in the remover **8** and this remover is then placed in the ring **22**. The simulated socket **23** is now rotated until the prongs of the tube will fit into the holes **24**. The set screw **28** is now screwed against the ring **22**, thus fixing the socket

23 with relation to the ring 22. The defective tube is now removed and a new tube is inserted into the socket 23. Thereafter the remover 8 is again caused to grip the new tube in the same manner previously described, and the new tube is thus exactly indexed with the position of the defective tube as it was removed from the set. The new tube can now be replaced in the set in the same manner described above.

Having described my invention, I claim:

1. An electronic tube puller and replacer for electronic circuits having tube sockets, comprising a ring, means removably mounting the ring on the electronic set, said ring surrounding a tube, means on the ring nonrotatably mounting said ring on the electronic set with relation to the tube, puller means engageable with said tube to remove the tube from its socket, and indexing means on the ring engageable by the puller means when said puller means engages a tube, said indexing means on the ring being engageable by the puller means in only one relative position of said ring and puller means.

2. An electronic tube puller and replacer for electronic circuits having tube sockets, comprising a ring, means removably mounting the ring on the electronic set, said ring surrounding a tube, means on the ring nonrotatably mounting said ring on the electronic set with relation to the tube, a tube puller comprising a pair of spaced arms positionable on each side of a tube, and means engaging the arms to press said arms against the tube, and indexing means on the ring engageable by said arms when said tube puller engages a tube, said indexing means on the ring being engageable by said spaced arms on the puller in only one relative position of said ring and arms on the puller.

3. An electronic tube puller and replacer for electronic circuits having tube sockets, comprising a ring, magnets on said ring magnetically engaging the tube socket, said magnets nonrotatably mounting said ring on the electronic set with relation to said tube, said ring encircling an electronic tube, a tube puller, said tube puller including means releasably engaging a tube, and indexing means on the ring engageable by said tube puller when said tube puller engages a tube, said indexing means on the ring being engageable by the said means on the tube puller in only one relative position of said ring and said means.

4. An electronic tube puller and replacer for electronic circuits having tube sockets, comprising a ring, magnets on said ring magnetically engaging the tube socket, said magnets nonrotatably mounting said ring on the electronic set with relation to said tube, said ring encircling an electronic tube, a tube puller, said tube puller including means releasably engaging a tube, and indexing means on the ring engageable by said tube puller when said tube puller engages a tube, said ring having vertical grooves therein comprising the indexing means, said vertical grooves being engageable by said means on the puller in only one relative position of said vertical grooves and said means on the puller.



5. An electronic tube puller and replacer for electronic circuits having tube sockets, comprising a ring, means removably mounting the ring on an electronic set, said ring surrounding a tube, means on the ring nonrotatably mounting said ring on the electronic set with relation to the tube, puller means engageable with said tube to remove the tube from its socket, and indexing means on the ring engageable by the puller means when said puller means engages a tube, said ring having vertical grooves therein comprising the indexing means, said grooves in the ring being engageable by the puller means in only one relative position of said ring and puller means.

6. An electronic tube puller and replacer for electronic circuits having tube sockets, comprising a ring, means removably mounting the ring on an electronic set, said ring surrounding a tube, means on the ring nonrotatably mounting said ring on the electronic set with relation to the tube, a tube puller comprising a pair of arms adapted to be pressed against the side of a tube, a head, means pivotally mounting the arms in the head, cam means on the head engaging the arms to cam said arms against a tube, and indexing means on the ring engageable by said arms when said puller engages a tube, said indexing means on the ring being engageable by said arms in only one relative position of said ring and puller.

7. An electronic tube puller and replacer for electronic circuits having tube sockets, comprising a ring, means removably mounting the ring on an electronic set, said ring surrounding a tube, means on the ring nonrotatably mounting said ring on the electronic set with relation to the tube, a tube puller comprising a pair of arms adapted to be pressed against the side of a tube, a head, means pivotally mounting the arms in the head, cam means on the head engaging the arms to cam said arms against a tube, and indexing means on the ring engageable by said arms when said puller engages a tube, said indexing means on the ring being engageable by said arms in only one relative position of said ring and puller, said ring having vertical grooves therein comprising the indexing means, said arms accurately fitting in the grooves.

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