United States Patent

[11] 3,587,034

[72] Inventor George P. Canell
Meadville, Pa.

[21] Appl. No. 806,085
[22] Filed Mar. 11, 1969
[45] Patented June 22, 1971
[73] Assignee National Teltronics Corporation
Yonkers, N.Y.

[54] COILED ANODE CLIP ASSEMBLY
2 Claims, 5 Drawing Figs.

[52] U.S. Cl. 339/102, 339/223
[51] Int. Cl. H01s 13/58
[50] Field of Search ..... 339/26, 67, 102, 103, 59, 223; 24/131 C

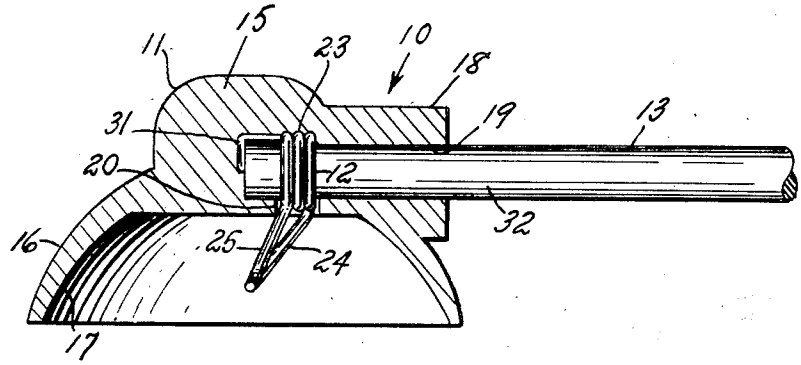
[56] References Cited

UNITED STATES PATENTS

1,865,207	6/1932	Persons	339/223
3,258,732	6/1966	Martin	339/59
3,412,366	11/1968	Pittman	339/223 X

Primary Examiner—Ernest R. Purser
Attorney—Charles E. Temko

ABSTRACT: An anode clip assembly, including a resilient cap element of conventional type, and an improved clip associated therewith, the clip being formed to include a plurality of axially aligned convolutions, a leg extending from each end of the coil formed by said convolutions, and having means thereon engaging the anode recess in a cathode-ray tube, movement of the legs in a direction mutually apart from each other serving to enlarge the effective internal diameter of the convolutions, whereby an insulated conductor may be inserted axially therealong, to be gripped upon release of the legs, thereby eliminating the necessity of soldering the lead to the clip. Movement of the legs toward each other enables the diverging terminals thereof to clear the opening in the recess in the tube without releasing the resilient grip upon the conductor.



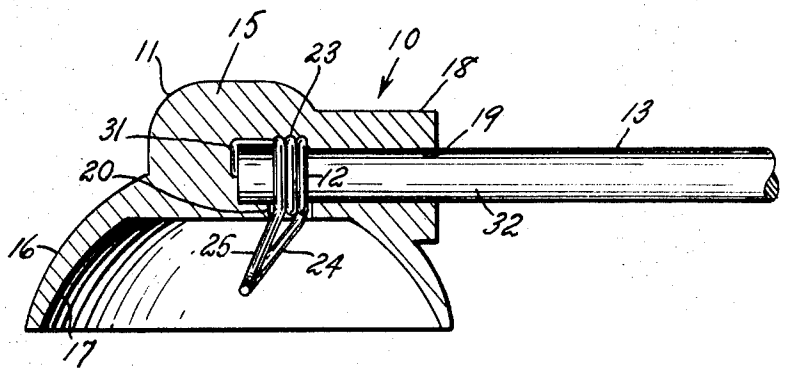


Fig. 1

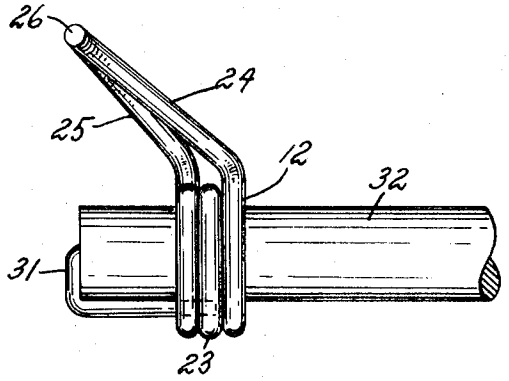


Fig. 2

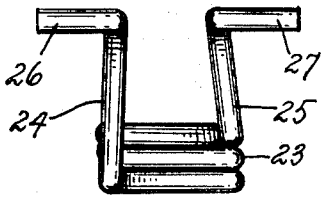


Fig. 3

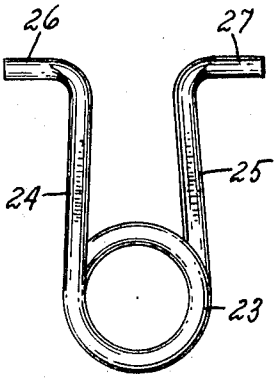


Fig. 4

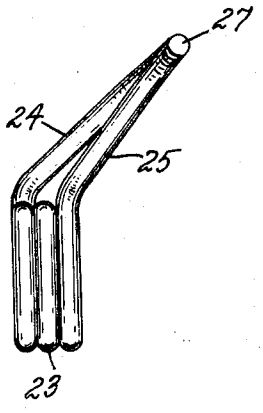


Fig. 5

COILED ANODE CLIP ASSEMBLY

This invention relates generally to the field of anode clips used in conjunction with cathode-ray tubes, particularly those used television receivers.

Anode clips of this type are known in the art, and have normally required and have soldering of the clip to the conductor of the wire lead to effect electrical communication therebetween. The presence of solder has caused drool, sharp points and flux residue which are left on the clip assembly which creates the possibility of high voltage breakdown, arcing and other side effects in a television receiver.

It is among the principal objects of the present invention to provide a solderless clip in which the above-mentioned adverse effect is substantially eliminated.

Another object of the invention lies in the provision of an improved clip assembly, in which the clip element obtains a resilient purchase upon the conductor of the wire lead, which can be readily connected and disconnected as often as required.

Another object of the invention lies in the provision of an improved anode clip construction, in which the cost of fabrication may be of a relatively low order, directly comparable with existing prior art devices, thereby permitting consequent wide sale, distribution and use.

A feature of the disclosed embodiment lies in the fact that the same may be incorporated into existing cap elements without extensive modification.

These objects and features, as well as other incidental ends and advantages, will more fully appear in the progress of the following disclosure, and be pointed out in the appended claims.

In the drawing, to which reference will be made in the specification, similar reference characters have been employed to designate corresponding parts throughout the several views.

FIG. 1 is a fragmentary longitudinal central sectional view of an embodiment of the invention.

FIG. 2 is a fragmentary view in elevation showing the attachment of the clip element upon the end of a lead wire.

FIG. 3 is a view in elevation of the clip element.

FIG. 4 is a plan view thereof.

FIG. 5 is a side elevational view thereof, as seen from the right-hand portion of FIG. 4.

In accordance with the invention, the device, generally indicated by reference character **10**, comprises broadly: a cap element **11** and a spring clip element **12** used in conjunction with a conductor **13**.

The cap element **11** may be of conventional unitary molded construction from natural or synthetic rubber or resinous materials to obtain a suitable degree of flexibility. It includes a base portion **15** of generally rounded configuration, and a cup-shaped flange **16** defining a recess **17** adapted to overlie the anode recess in a cathode-ray tube (not shown). A laterally extending tubular portion **18** defines a bore **19** communicating with the recess **17** through an opening **20**.

The clip element **12** may be suitably formed from music wire, and includes a plurality of axially aligned convolutions **23** terminating in first and second legs **24** and **25**, respectively.

Each of the legs includes an outwardly extending portion at **26** and **27**, respectively, which are adapted to engage the tube anode recess, as is known in the art. From a consideration of FIG. **4**, it may be noted that moving the legs **24—25** in mutually opposite directions, will serve to enlarge the effective internal diameter of the convolutions, to a degree where it is slightly larger than the diameter of the conductor **13**, so that upon allowing the convolutions to contract, the conductor is gripped therebetween. It will also be noted that moving the legs **24—25** toward each other, as is necessary in order to allow the terminals **26—27** to clear the opening in the tube leading to the recess does not serve to reduce the tension, but rather to slightly increase it, so that there is no danger of losing purchase on the terminal during this operation.

Referring to FIGS. **1** and **2** in the drawing, since the convolutions are of a size to engage the insulation **32** of the conductor **13**, rather than the conductor **31**, the electrical communication is established by stripping a portion of the insulation from the conductor, and bending the same back to overlie the outer surface of the insulation prior to inserting the conductor into the opening formed by the convolutions. Upon contraction, the convolutions will firmly engage the outer surface of the insulation, and establish electrical contact with one or more convolutions at the same time. Should, because of manufacturing tolerances, one or more of the engaged convolutions be slightly tighter than the others, since contact of all of the convolutions with the wire occurs, there is no loss in conductivity through increased electrical resistance.

In the event that it becomes necessary to replace the conductor, the same can be released from the clip by moving the legs apart from each other, as described hereinabove, without the necessity of melting solder, and resoldering, as has been the case in prior art devices. Further, no cleaning operation is necessary during such a procedure, as the interconnection between the conductor and the clip is solely by resilient forces.

I wish it to be understood that I do not consider the invention limited to the precise details of structure shown and set forth in this specification, for obvious modifications will occur to those skilled in the art to which the invention pertains.

I claim:

1. In an anode connector clip assembly for use with the anode recess of a cathode-ray tube, the improvement comprising: a flexible cap element, and a wire clip element; said cap element including a cup-shaped recess and a laterally extending bore communicating with said recess; said clip element including a length of spring wire having a plurality of coaxially positioned convolutions, and first and second legs extending laterally outwardly from said convolutions at either end thereof and terminating in oppositely directed terminal portions a distance sufficient to engage said anode recess when said convolutions are in relatively unstressed condition; and a wire conductor extending through said laterally extending bore and projecting through said convolutions to be resiliently gripped thereby, said clip element being disposed within said bore, substantially at an inner end thereof.

2. Structure in accordance with claim **1**, said legs being positioned such that movement mutually apart serves to enlarge the effective diameter of said convolutions to allow insertion of said conductor therein.