

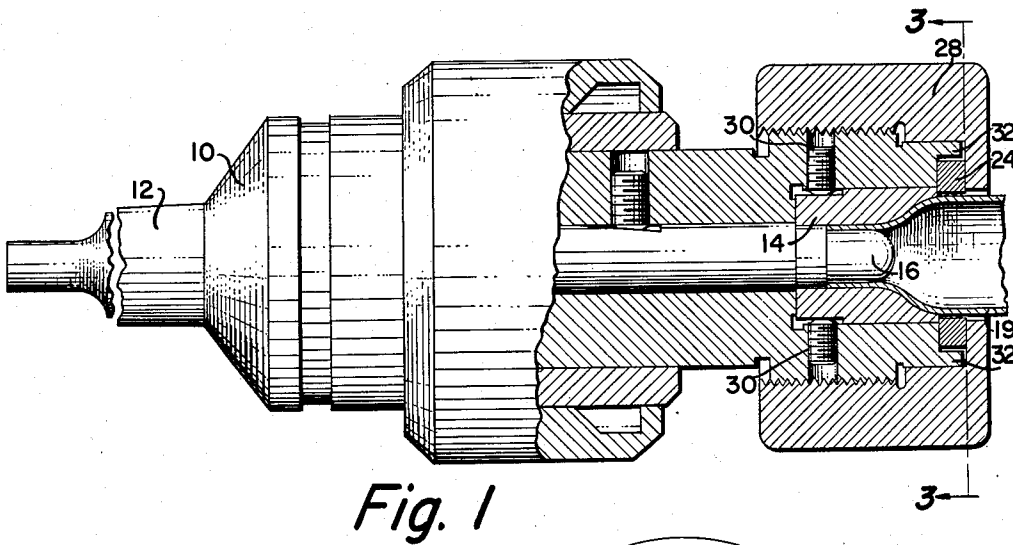
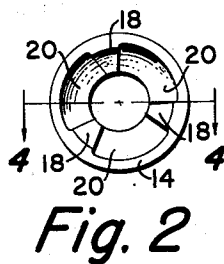
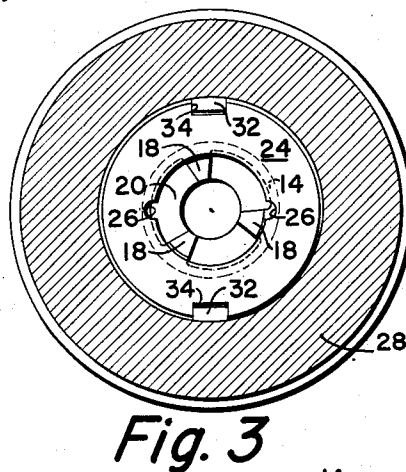
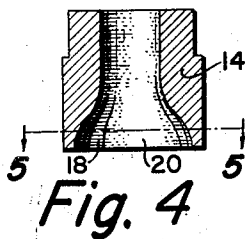
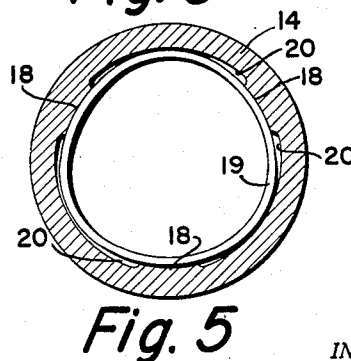
July 6, 1954

H. T. WRIGHT

2,682,849

FORMING TOOL FOR REDUCING STOCK

Filed Feb. 12, 1952



INVENTOR.
Homer T. Wright.
BY *Willits, Hardman & Fisher*
His Attorneys.

UNITED STATES PATENT OFFICE

2,682,849

FORMING TOOL FOR REDUCING STOCK

Homer T. Wright, Dayton, Ohio, assignor to General Motors Corporation, Dayton, Ohio, a corporation of Delaware

Application February 12, 1952, Serial No. 271,215

4 Claims. (Cl. 113—52)

1

This invention relates to refrigerating apparatus and more particularly to a method and a tool for spinning tubular stock for use in fabricating refrigerant filters and the like.

In manufacturing tubular housings for filters and the like, it is standard practice to place a length of tubular stock in a holder and to exert a reducing pressure on the stock by means of a spinning tool as the tubular stock and the tool are relatively rotated and moved toward each other. The spinning tools used in the process are usually provided with an annular portion which gradually decreases in cross-section and thereby exerts a reducing pressure continuously around the entire circumference of the stock to progressively heat the latter to an easy workable condition. Prior to this invention it was considered necessary to have the spinning device exerting very high pressure on the surface being shaped and to engage the stock throughout a major portion of the circumference, whereas it has been discovered that a spinning tool having a plurality of properly designed stock engaging portions will effectively reduce the diameter of the tubular stock even though the stock engaging portions contact the stock only throughout a minor portion of its circumference.

It is an object of this invention to provide an improved spinning device in which a plurality of specially shaped stock engaging portions are provided.

Another object of this invention is to provide a spinning device which is so constructed and arranged that it may be used in a conventional drill press.

Still another object of this invention is to provide an improved spinning device in which the guide for the tubular stock is made separate from the actual spinning tool whereby the one may be replaced without replacing the other.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred form of the invention is clearly shown.

In the drawing:

Figure 1 is an elevational view of a preferred embodiment of the invention with parts broken away.

Figure 2 is an end elevational view showing the shape of the spinning insert.

Figure 3 is a sectional view taken substantially on line 3—3 of Figure 1.

Figure 4 is a cross-sectional view of the spinning insert taken on line 4—4 of Figure 3.

2

Figure 5 is a sectional view taken substantially on line 5—5 of Figure 4.

Referring now to Figure 1 of the drawing wherein there is shown a preferred embodiment of the invention, reference numeral 10 generally designates a holding fixture which is provided with a spindle 12 for use in mounting a fixture in a conventional drill press. The holding fixture or adapter 10 serves to removably support a spinning insert 14 and a pilot element 16 as shown.

The spinning insert 14 is provided with a central cavity for receiving the stock to be spun or reduced. The wall of the cavity is provided with a plurality of substantially triangular shaped stock engaging ribs 18 which are arranged as best shown in Figure 2 of the drawing. It will be noted that by virtue of the triangular shape of the stock engaging ribs, the base portion of each triangle contacts the incoming stock 19, and as the stock is gradually reduced in diameter it moves towards the apex of the triangle with the result that a progressively narrower portion of the triangle engages the stock. The wall of the central cavity is cut away between the ribs 18 as shown at 20 so as to permit the stock to expand or deform into the relief recess formed by the cutaway portions 20 as shown in Figure 5.

For purposes of illustrating the invention, I have shown an arrangement in which there are three of the stock engaging ribs. It should be noted that the stock engaging ribs comprise somewhat less than one-third of the circumference with the result that the major portion of the stock is free to deform into the relief recesses. With three ribs arranged as shown the stock is reduced and expanded three times for each revolution of the spinning tool. By virtue of the above described arrangement, it is possible to operate the spinning tool at speeds in the neighborhood of 1200 R. P. M. and to reduce effectively the diameter of the stock without exerting excessively high axial pressures such as commonly required in spinning tools of the type now commonly in use in the industry.

As best shown in Figure 1 of the drawing, a guide ring 24 has been provided for guiding the incoming stock as it moves into contact with the spinning insert 14. This guide ring is made separate from the spinning insert 14 so as to make it possible to replace either the guide ring or the spinning insert without necessarily replacing the other. Furthermore, the arrangement simplifies the problem of manufacturing the spinning device. The internal diameter of the ring 24 is preferably slightly greater than the external

3

diameter of the stock to be turned so as to avoid the likelihood of seizure between the stock and the guide ring. Furthermore, the guide ring 24 is provided with cutaway portions 26 so that even though a piece of slightly oversized stock may be inserted it would be impossible for the guide ring to engage the stock throughout its entire circumference.

The guide ring 24 is clamped in place by means of the removable retainer 28 which has a screw threaded connection with the main adapter 10. One or more set screws 30 are provided as shown for engaging flat surfaces on the insert for preventing the insert 14 from rotating relative to the holder or adapter 10. By removing the retainer 28 and loosening the set screws 30, it is possible to remove both the guide ring 24 and the spinning insert 14. It will be noted that when the parts are assembled for use the retainer 28 firmly clamps the guide ring against the spinning insert 14 so as to firmly hold the insert 14 in place. The adapter 10 is provided with lugs 32 which engage within slots 34 provided in the outer periphery of the guide ring so as to prevent relative rotation between the guide ring and the adapter and so as to accurately position the guide ring relative to the insert 14.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted as may come within the scope of the claims which follow.

What is claimed is as follows:

1. In combination, a forming tool for reducing stock having an axially extending cavity at least a portion of which is of progressively diminishing cross-section longitudinally of the tool, the wall of said cavity being adapted to engage and reduce the stock upon relative rotation and axial movement toward one another of the stock and the tool, said wall being provided with a plurality of triangularly shaped stock engaging ribs with the bases of said triangles disposed adjacent the inlet of said cavity and with their vertexes extending toward the outlet of said cavity, a holder for removably supporting said forming tool, and guide means for the incoming stock removably carried by said holder, said guide means comprising a ring clamped between a portion of said holder and said forming tool.

2. In combination, a forming tool for reducing stock having an axially extending cavity at least a portion of which is of progressively diminishing cross-section longitudinally of the tool, the wall of said cavity being adapted to engage and reduce the stock upon relative rotation and axial

4

movement toward one another of the stock and the tool, said wall being provided with a plurality of triangularly shaped stock engaging ribs with the bases of said triangles disposed adjacent the inlet of said cavity and with their vertexes extending toward the outlet of said cavity, a holder for removably supporting said forming tool, and guide means for the incoming stock removably carried by said holder, said guide means comprising a ring clamped between a portion of said holder and said forming tool and having a plurality of stock engaging segments provided on the inner periphery of the ring.

3. In combination, a forming tool for reducing stock having an axially extending cavity at least a portion of which is of progressively diminishing cross-section longitudinally of the tool, the wall of said cavity being adapted to engage and reduce the stock upon relative rotation and axial movement toward one another of the stock and the tool, said wall being provided with a plurality of triangularly shaped stock engaging ribs having their vertexes extending toward the outlet of said cavity, a holder for removably supporting said forming tool, and guide means for the incoming stock removably carried by said holder, said guide means comprising a ring clamped between a portion of said holder and said forming tool and having a plurality of stock engaging segments provided on the inner periphery of the ring, the internal diameter of said guide ring being slightly greater than the diameter of the stock to be reduced.

4. In combination, a forming tool for reducing stock having an axially extending cavity at least a portion of which is of progressively diminishing cross-section longitudinally of the tool, the wall of said cavity being adapted to engage and reduce the stock upon relative rotation and axial movement toward one another of the stock and the tool, said wall being provided with a plurality of stock engaging ribs for engaging said stock, a holder for removably supporting said forming tool, and guide means for the incoming stock removably carried by said holder, said guide means comprising a ring clamped between a portion of said holder and said forming tool.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
172,443	Ide	Jan. 18, 1876
2,349,168	Hill	May 16, 1944
2,358,711	Hill	Sept. 19, 1944
2,449,247	Paucek	Sept. 14, 1948