Aug. 22, 1933. H. C HOWSAM 1,923,267

SPOOL

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Fig. 1

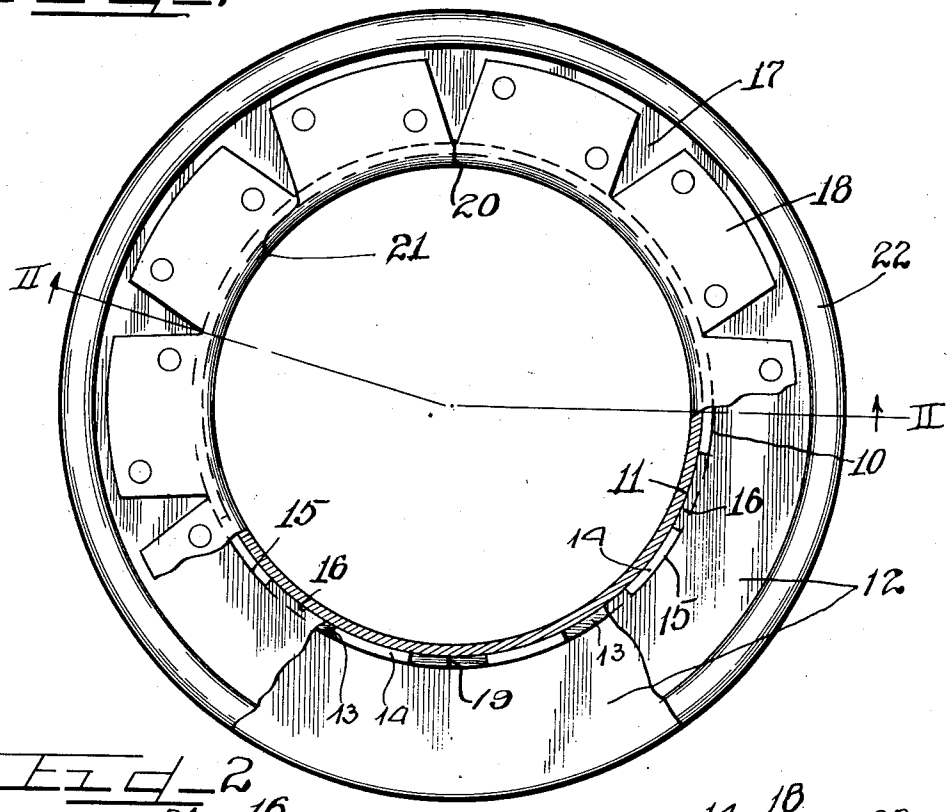
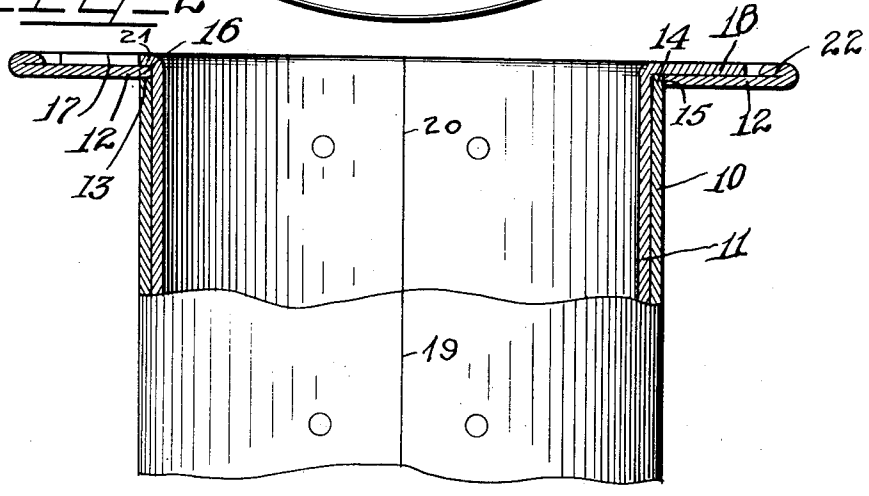


Fig. 2



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SPOOL

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Application September 15, 1930
Serial No. 481,910

1 Claim. (Cl. 242—123)

My invention relates to metal spools adapted particularly for use in the process of wire drawing or annealing.

On this class of spool, wire is sometimes wound cold and the spool with the wire thereon is placed in a suitable furnace for the annealing of the wire. Sometimes the spools receive the hot wire directly as it comes from the dies. In each case the spool is subjected to considerable heat, and, when the wire is wound thereon hot, the spool is further subjected to the heavy pressure of the wire as it contracts during cooling. The spool must, therefore, be of sufficient strength and rigidity to resist distortion by the heat and distortion and crushing under the contraction pressure of the wire.

The object of the invention is, therefore, to produce a strong and rigid spool of sheet metal parts which can be economically manufactured and which will withstand the heat and wire contraction pressure. I accomplish this by providing a double shell hub for the spool with the outer shell intimately interlocked with the spool heads and with the ends of the inner shell deflected around the interlocking joints between the outer shell and heads and intimately secured against the outer faces of the heads, preferably by spot welding.

My improved structure and its advantages will be apparent from the following specification and the accompanying drawing, on which drawing:

Figure 1 is an end elevation with parts broken away, and

Figure 2 is a section on plane II—II of Figure 1.

The spool shown comprises the outer hub shell 10, the inner hub shell 11 and the spool ends or heads 12. These parts are all of sheet metal of gauges depending upon the strength desired.

The outer shell 10 is cylindrical and bent up from a rectangular piece of sheet metal. At its ends the shell has the rectangular notches 13 between which are the rectangular teeth 14. The ends or heads 12 are annular and the inner edges thereof have the notches 15 leaving the teeth 16. The diameter of the outer shell 10 is such that the shell at its ends will engage in the openings of the heads with the teeth 14 extending into the head notches 15, and the head teeth 16 engaging in the notches 13 of the shell, the teeth being of a width to snugly fit in the notches. The depth of the teeth 14 is equal to the thickness of the metal of the heads, while the depth of the head teeth 16 is equal to the thickness of the metal of the shell 10. The teeth and notches form a rigid interlocking connection which securely anchors the heads to the outer shell against rotational and longitudinal inward displacement.

The inner shell 11 is formed from a rectangular piece of sheet metal, and the diameter of the shell is such that it will fit within and against the outer shell. The shell 11 is primarily cylindrical throughout so that it may be inserted into the shell 10. At its ends the inner shell is slotted longitudinally as indicated at 17 to define flange sections 18. After insertion of the inner shell these projecting flange sections are deflected radially outwardly and against the outer faces of the heads, to which heads they are rigidly secured, as, for example, by spot welding. The cylindrical sections of the shell may also be secured together by spot welding, and this is done preferably adjacent to the seam 19 of the outer shell and the seam 20 of the inner shell, which seams may be substantially diametrically opposite.

When cutting the slots 17 the depth thereof is preferably limited in order to leave the uncut part of the inner shell of a length sufficiently greater than the length of the outer shell so that, when the inner shell is inserted in the outer shell, the continuous or uncut end sections or zones 21 may be deflected around the joints between the outer shell and the heads when the flange sections 18 are deflected against the outer faces of the heads. The sections or zones 21 then form smooth bearing surfaces when the spool is mounted on supports to receive wire thereon or to unwind wire therefrom.

The deflecting of the inner shell ends around the interlocking joints between the outer shell and the heads will rigidly hold the outer shell and heads together and maintain the interlocking joints. Furthermore, the flange sections 18 welded to the heads will greatly increase the strength of the heads and will add stiffness and rigidity to the spool structure. The peripheral sections 22 of the heads are preferably deflected inwardly toward the outer faces of the heads to form a stiffening and strengthening rim. The gauge of the metal of the heads may be larger than that of the shells, or the deflection to form the rims or tires 22 may be such that the planes of the outer faces of the rims will be coincident with or outside of the planes of the outer faces

of the flange sections 18 so that the spool will seat accurately on a flat support.

Where the hub is double, i. e., where it is constructed of two concentric shells instead of a single shell of greater gauge, the strength is materially increased, the inner shell acting as a sort of truss for bracing the outer shell which directly receives the hot wire. In actual practice, the two shells will never intimately engage, but will be separated more or less by an air space along the sections away from the points where the shells are spot welded together. Such films of air will assist in insulating against too rapid heat conduction to the inner shell from the outer shell. The welding of the flanged ends of the inner shell against the spool heads will materially increase the strength and rigidity of the heads and will also strengthen the inner shell against distortion under heat. By deflecting the body of the inner shell below the bases of the flanged sections around the interlocking joints between the outer shell and the heads, the continuous unbroken corners at the ends of the spool bore will greatly increase the strength where it is most needed and will also form smooth, rounded seats for the arbors or spindles which support the spool for rotation during winding of wire thereon or unwinding of wire therefrom.

It is evident that my improved structure involving the double shell hub and the interlocking connections between the shells and heads can be advantageously and efficiently employed in various types of spool.

Changes and modifications may also be made without departing from the scope and principles of my invention, and I, therefore, do not desire to be limited to the precise structure and arrangement shown and described.

I claim as follows:

A spool of the class described consisting of an outer cylindrical sheet metal shell, an inner cylindrical sheet metal shell, and annular sheet metal heads, said shells being in intimate engagement and being spot welded together, said heads being notched along their inner edges to provide teeth of no greater depth than the thickness of the metal of said outer shell, said outer shell at its ends being notched to provide teeth of no greater depth than the thickness of the metal of said heads, the teeth and notches on said shell intimately fitting and receiving the notches and teeth of said heads whereby said heads are intimately joined to said shell in planes at right angles with the cylindrical outer surface of said outer shell and to provide sharp right angled corners between said heads and the outer surface of said outer shell and to eliminate curved or rounded corners, the end section of said inner shell being deflected around the interlocking joints between said heads and outer shell and the end sections of the inner shell beyond the deflected zones being slotted to provide flanges which are intimately secured against the outer faces of said heads by spot welding and extend substantially to the peripheries of said heads to reinforce said heads, the outer peripheral sections of said heads being curled over to engage against the outer faces of the heads to surround the notched ends of said inner shell.

HILYARD C. HOWSAM.