Oct. 11, 1938. J. W. BAXTER 2,132,555

METHOD OF MAKING A TUBULAR ARTICLE

Filed Dec. 21, 1936

Fig. 1.

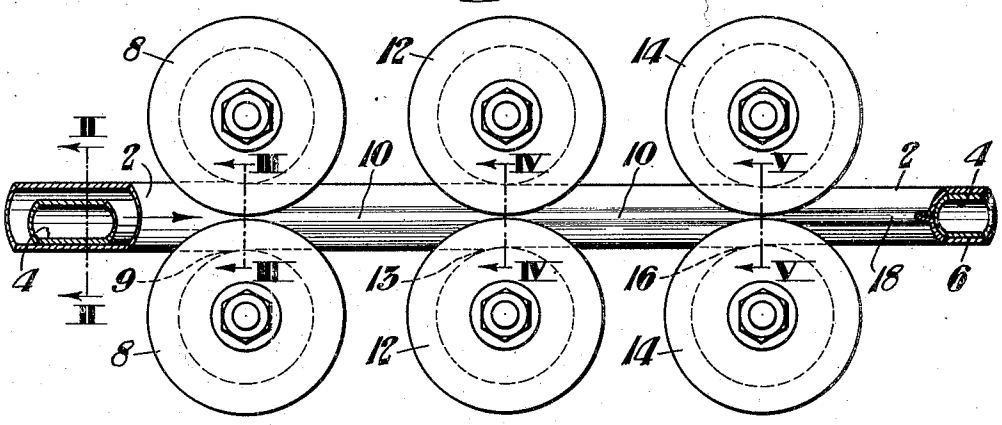


Fig. 2.

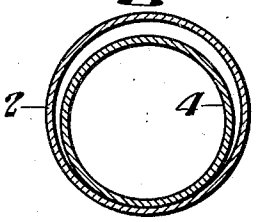


Fig. 3.

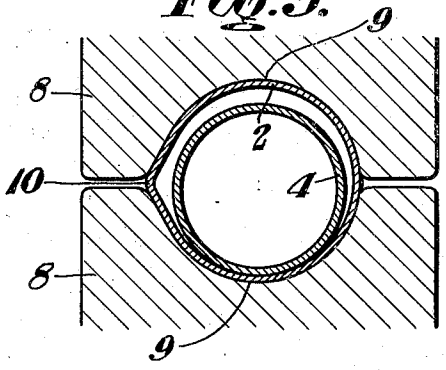


Fig. 4.

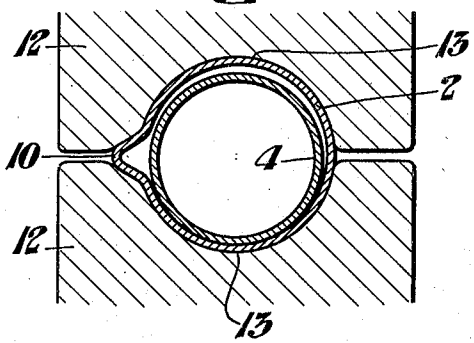
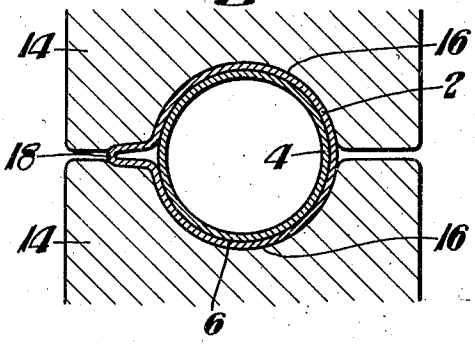


Fig. 5.



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Patented Oct. 11, 1938 2,132,555

UNITED STATES PATENT OFFICE

2,132,555

METHOD OF MAKING A TUBULAR ARTICLE

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Application December 21, 1936, Serial No. 117,083

1 Claim. (Cl. 153—1)

This invention relates to a method of making a tubular article and particularly one which is provided with a longitudinal outwardly extending lip or fin in the outer circumference thereof.

An object of this invention is to provide an inexpensive method by which a tubular article, which readily transfers heat between the inner and outer surfaces thereof, can rapidly be made.

The above and further objects will become apparent by referring to the following description and the accompanying drawing, in which:

Figure 1 is an elevation of one embodiment of apparatus for performing the steps of my invention;

Figure 2 is a section on line II—II of Figure 1;

Figure 3 is a section on line III—III of Figure 1;

Figure 4 is a section on line IV—IV; and

Figure 5 is a section on line V—V.

Referring more particularly to the accompanying drawing in which apparatus, capable of functioning in accordance with my invention, is illustrated, the numeral 2 indicates a conventional tubular blank in which there is inserted a second tubular blank 4, having a smooth circular bore. The inside diameter of the tubular blank 4 is substantially that desired in the final product or heat transfer conduit 6 which is illustrated in Figures 1 and 5. The inside diameter of the tubular blank 2 is appreciably larger, preferably about 10 to 20 percent., than the outside diameter of the tubular blank 4, so that the adjacent circumferences are of substantially different lengths. Both tubular blanks are preferably made from stainless steel so that they will not corrode but will readily transfer heat.

In commencing to form the final product or heat transfer conduit 6 from the tubular blanks 2 and 4, the outer tubular blank 2 with the tubular blank 4 suitably held therein is passed through a pair of rolls 8. The rolls 8 forming a roll pass 9 are journaled and driven in any suitable manner (not shown). The roll pass 9 formed by the rolls 8 is designed to sink the outer tubular blank 2 about the inner tubular blank 4. As the diameter of the outer tubular blank 2 is reduced a small portion 10 in the circumference thereof is made to extend outwardly therefrom. By extending the portion 10 outwardly from the outer tubular blank 2, the length of its circumference is not changed in the rolling operation. The portion 10 is straight and extends the length of the outer tubular blank 2 while preferably projecting radially therefrom.

The outer tubular blank 2 is led from the rolls 8 to a suitably mounted pair of rolls 12 which form a roll pass 13 in alignment with the roll pass 9. The roll pass 13 is designed to further sink the outer tubular blank 2 on the inner tubular blank 4 and also act upon the outer tubular blank 2 to cause the portion 10 thereof to project fairly sharply therefrom.

In order to finish the heat transfer conduit 6, the tubular blanks 2 and 4 are passed through a pair of rolls 14 which form a final roll pass 16. The rolls 14 are journaled and driven in any suitable manner (not shown) and the roll pass 16 is aligned with the roll passes 9 and 13. The function of the roll pass 16 is to completely sink the outer tubular blank 2 upon the inner tubular blank 4 and to form a straight, longitudinally extending drip-lip flange, or fin 18 which is substantially V-shaped in section from the portion 10 of the outer tubular blank 2. All of the inner surface of the outer tubular blank 2 except that of the fin 18 is made bear upon, or fit tightly against, the outer surface of the inner tubular blank 4 so that the best possible heat transferring relation is secured therebetween.

The heat transfer conduit 6 is particularly adapted for use as a liquid regenerator or cooler where clean operating parts are required. Both the inner and outer surfaces of the finished article resist corrosion and, due to the round bore of the inner tubular blank 4, both surfaces thereof are easily cleaned.

While I have shown and described one form of apparatus for performing the steps of my method of making a tubular article, it will be appreciated that variations thereof can be made without departing from the scope of my invention as defined by the following claim.

I claim:

That method of manufacturing a heat transfer conduit having a smooth inner bore and a longitudinally directed drip-lip or fin on the outer surface thereof which comprises positioning a tubular blank having substantially the inner diameter of the finished conduit in a second tubular blank, the inside diameter of said outer tubular blank being appreciably larger than the outer diameter of said inner tubular blank, continuously and progressively rolling the outer tubular blank upon the inner tubular blank to form a straight longitudinally directed radially outwardly extending drip-lip or fin of U-shaped cross-section in said outer blank and to bring said outer blank except that portion thereof forming the drip-lip or fin in tight heat transferring relation with all portions of the inner tubular blank while maintaining substantially the same cross-sectional thickness of the outer tubular blank.

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