July 8, 1930. H. E. McCRERY 1,770,163

SHIPPING DRUM AND METHOD OF MAKING THE SAME

Filed July 8. 1927

Fig. 1.

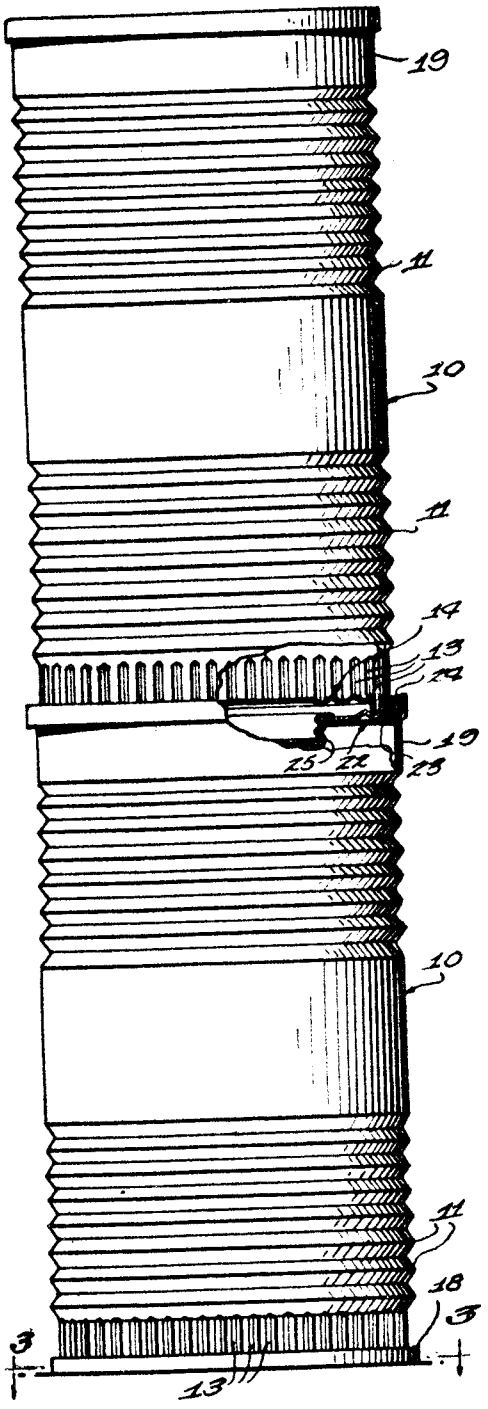


Fig. 2

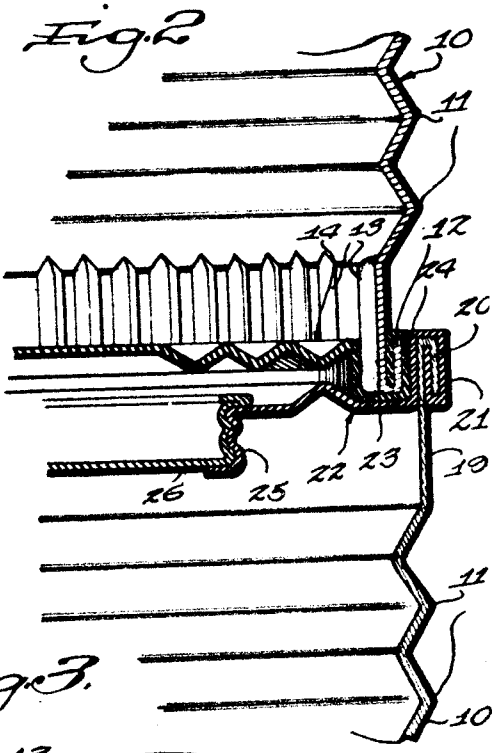


Fig. 3.

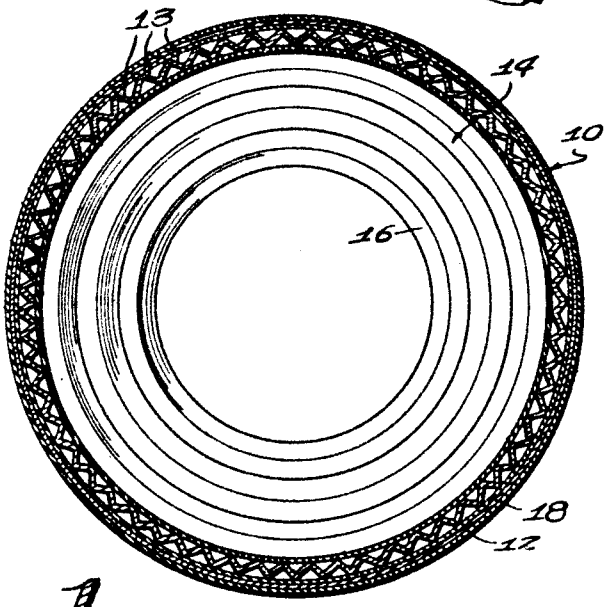
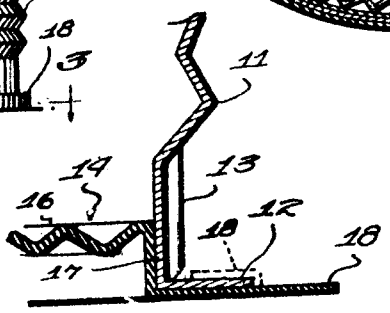


Fig. 4.



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UNITED STATES PATENT OFFICE

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SHIPPING DRUM AND METHOD OF MAKING THE SAME

Application filed July 8, 1927. Serial No. 204,363.

This invention relates to shipping drums and method of making the same.

The use of metal shipping drums has become very extensive in recent years and numerous efforts have been made to make a drum of relatively light gage which would be sufficiently strong to enable it to be subjected to rough usage when used for shipping heavy materials. Efforts also have been made to provide a drum structure of such a character that the ends of the drums might be nested to permit the drums to be arranged one above another to facilitate storage and shipment. Extreme difficulty has been encountered in providing a relatively light gage drum which may be manufactured at a comparatively low cost and which would possess the desired characteristics referred to above.

An important object of the present invention is to provide a novel form of metal shipping drum the structure of which is such as to adapt it for use in shipping relatively heavy materials without causing distortion of the drum, and particularly the bottom thereof, when it is subjected to rough usage.

A further object is to provide novel reinforcing means for the bottoms of the drums.

A further object is to provide a shipping drum having a head attaching flange at the bottom thereof, and provided with longitudinal reinforcing ribs which extend downwardly to the attaching flange, and to provide a head inner and outer portions of which are adapted to contact with opposite sides of the reinforcing ribs.

A further object is to provide a drum structure the ends of which are substantially identical in form, and wherein the provision of the reinforcing ribs referred to reduces the external diameter of the bottom of the drum whereby it is adapted to be received in the head and upper end of a drum arranged therebeneath in order that the drums may be arranged one upon another in vertical columns.

A further object is to provide a novel method of making drums whereby the finished articles possess the physical characteristics outlined above.

Other objects and advantages of the invention will become apparent during the course of the following description.

In carrying out the present method a substantially cylindrical drum blank formed of sheet metal is employed, and the drum may be rolled intermediate its ends to provide circumferential reinforcing ribs. These ribs form no part of the present invention and may be of any desired form. The circumferential ribs preferably terminate a substantial distance from the ends of the drum, as will become apparent. Each end of the body of the drum is rolled to provide an outstanding annular head attaching flange, and the lower end of the body is provided preferably throughout its circumference with ribs extending longitudinally of the drum. I am aware that drums have been manufactured which include longitudinal ribs arranged adjacent one or both ends, but such ribs do not extend to the end of the drum, that is, to a point adjacent the head attaching flange since it has been thought that the provision of such ribs, which reduce the diameter of the end of the drum, would result in crimping the head attaching flange so that the head could not be attached thereto and provide a leak-proof joint. In the present method, however, the ribs extend entirely to the end of the drum, that is, to the head attaching flange, and have been found to reduce the diameter of the end of the drum without crimping the head attaching flange whereby the bottom of the finished drum is reduced in diameter to permit the nesting action referred to. After the longitudinal ribs and head attaching flange have been formed, a head is arranged beneath and against the flange to be secured to the drum. The head is preferably of greater diameter than the flange, thus providing an annular outstanding portion which is initially rolled inwardly over the flange when securing the head in position. The head employed preferably is provided with a cylindrical portion which fits within the portion of the drum provided with the longitudinal ribs, and after the outstanding portion of the head has been rolled inwardly over the flange of the body, the latter element and the outer portion of the

head are rolled inwardly against the outer portions of the ribs. Thus the head is secured in position and portions thereof contact with opposite sides of the longitudinally ribbed portion of the drum. This portion of the drum is exceedingly rigid thus permitting a tight rolling action to take place, the joint between the body flange and head being such as to effectually prevent leakage.

A similar head is provided for the upper end of the drum and is attached before the latter has been filled with material. The upper end of the drum is not provided with the longitudinal ribs, and accordingly retains its normal diameter. The head provided for the upper end of the drum accordingly is larger than the lower head, but otherwise is identical therewith and is attached in the same manner, the upper end of the drum also being provided with a head attaching flange of the character previously referred to. The ends of the finished drum are of such character that the external diameter of the lower extremity of the drum is substantially equal to the internal diameter of the cylindrical portion of the upper head whereby it will be apparent that the drums are adapted to be arranged one upon another with the ends thereof nested to provide vertical columns of drums to facilitate storage and shipment.

In the drawings I have shown one form of drum constructed in accordance with the invention. In this showing,

Figure 1 is a side elevation of a pair of nested drums, parts being shown in section,

Figure 2 is a fragmentary vertical sectional view through the nested portions of two superimposed drums,

Figure 3 is a horizontal sectional view of one of the drums taken through the longitudinal ribbed portion thereof, and,

Figure 4 is a fragmentary vertical sectional view of the lower portion of a drum showing the method of attaching the head thereto.

Referring to the drawings the numeral 10 designates the bodies of a pair of superimposed forms each of which is identical in construction and only one of which need be referred to in detail. The drum is provided with reinforcing means preferably in the form of circumferential ribs 11. As previously stated, these ribs form no part of the present invention and the body of the drum intermediate its ends may be reinforced in any desired manner.

Referring to Figure 4, the numeral 12 designates an outstanding annular head attaching flange formed on the lower end of the drum. The adjacent portion of the body of the drum is provided with longitudinally extending ribs 13, these ribs being of any desired length and extending to points adjacent the attaching flange 12. The longitudinal ribs are preferably rolled in the body of the drum and materially reduce the diameter of the lower end of the drum. It has been found that this reducing action is adapted to take place without crimping or otherwise destroying the flat shape of the flange 12, and accordingly the lower head to be referred to is adapted for attachment to the flange and to cooperate therewith to form a leak-proof joint.

A head designated as a whole by the numeral 14 is adapted to be attached to the lower end of the drum. This head is provided with an inner disk like portion 15 in which may be rolled suitable reinforcing ribs 16. At the extremity of the disk portion of the head the latter extends downwardly as at 17 to form a cylindrical flange which snugly fits within the longitudinally ribbed portion of the body of the drum, as clearly shown in Figure 4. Beneath the cylindrical portion 17 the head is provided with an outstanding annular flange 18 which is materially larger in diameter than the body flange 12. When the head is to be attached to the drum, the portion 17 is inserted within the end of the drum and the projecting portion of the flange 18 is rolled inwardly over the flange 12, as shown in dotted lines in Figure 4. The portions of the flanges 12 and 18 extend beyond the body of the drum and are then rolled upwardly and inwardly against the outer faces of the ribs 13, as shown in Figure 2. Owing to the rigidity provided by the ribs 13 the head may be tightly rolled thereagainst to rigidly secure the head in position, and the contacting faces of the flanges 12 and 18 provide an efficient leak-proof joint. This joint is permitted to be formed only because of the fact that the flat shape of the flange 12 is not disturbed by the formation of the ribs 13.

The upper end of the drum retains its cylindrical shape, as shown at 19, thus preserving the normal diameter of this portion of the drum. The upper end of the drum also is provided with a flange 20 similar to the flange 12, and this flange is adapted to coact with a flange 21 formed on a head 22 to provide a leak-proof joint at the upper end of the drum. The upper head also is provided with a disk portion 23 and a cylindrical portion 24, the latter snugly fitting within the upper end of the drum body. The upper head is secured to the body in the same manner as the lower head and the method of attaching the upper head need not be referred to in detail. If desired, the upper head may be provided with a central depending annular portion 25 threaded to receive a cover 26. The provision of this cover permits the drum to be wholly assembled at the factory and to be filled and closed by the shipper. As shown in Figure 2 the external diameter of the lower extremity of each

drum is substantially equal to, but not greater than the internal diameter, of the cylindrical portion 24 of the upper head, and consequently the lower end of one drum is adapted to be arranged in the cylindrical portion of the head of another drum and to rest upon the disk portion 23 of the latter head. This structure permits the drums to be nested whereby they may be arranged in vertical columns to facilitate storage and shipment.

The operation of the drum will be clearly apparent from the foregoing description. The provision of the longitudinal ribs 13 reduces the diameter of the lower end of the drum to permit the nesting action referred to and also greatly stiffens the end of the drum to prevent distortion thereof when the drum is dropped on its end or otherwise roughly handled. It also has been found that the longitudinally ribbed portions of the drums possess a slight degree of radical elasticity to permit the head to be tightly rolled thereagainst, this slight resiliency serving to effectively maintain the leak-proof joint between the head and body flanges. It will be apparent, of course that the upper head may be made solid, in which case it will be attached by the shipper after the drum is filled, or it may be provided with the closure 26 previously referred to.

It is to be understood that the form of the drum and the method of making the same are to be taken as preferred examples of the same and that various changes may be made both as to the method and details of construction without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. The method of forming drums which consists in forming an outstanding annular flange on one end of a cylindrical body, forming elongated logitudinal ribs on said end of the body to reduce the diameter of such portion of the body and extending substantially to the flange thereof, and securing a head to to the flange with portions of the head arranged against opposite sides of the longitudinal ribs.

2. The method of forming drums which consists in forming an outstanding annular flange on one end of a cylindrical body, forming longitudinal ribs on said end of the body to reduce the diameter of such portion of the body and extending substantially to the flange thereof, arranging a head against said end of the body with a portion thereof fitting within the longitudinally ribbed portion of the body and a portion projecting beyond the flange of the body, turning the projecting portion of the head over the flange, and turning the flange and the outer portion of the head inwardly against the outer portions of the longitudinally ribbed portion of the body.

3. A drum comprising a sheet metal body having an attaching flange at one end thereof and a plurality of elongated longitudinal ribs formed in said end and extending substantially to said flange, the ribbed portion of said body being of reduced diameter and a head having a cylindrical portion fitting within the ribbed portion of said body and an outstanding portion secured to said flange.

4. A drum comprising a sheet metal body having an attaching flange at one end thereof and a plurality of longitudinal ribs formed in said end and extending substantially to said flange to reduce the diameter of said end of the body, and a head having a central disk portion and a cylindrical portion at the outer extremity thereof fitting within the ribbed portion of said body, said head further being provided with an outstanding portion having its extremity turned about said flange, the outstanding portion of said head and said flange being turned upwardly and inwardly against the outer portion of the ribbed portion of said body.

In testimony whereof I affix my signature.

HAROLD E. McCRERY.