

Barrel

The present invention relates to a barrel of thermoplastic synthetic material, having a rolling ring extending substantially axially from a body portion of the barrel adjacent a bottom end portion of the barrel tapering inwardly towards the barrel bottom, the rolling ring being spaced radially from the bottom end portion by an annular groove.

Barrels are generally provided with supporting and conveying rings which are mounted on the barrel body portion adjacent end portions. The rings are solid in cross-section and have a horizontal and a vertical abutment surface for the gripper arms of a barrel gripping device.

Such barrels are generally produced in their entirety by a blow-moulding process in which the supporting and conveying rings are moulded integrally from the barrel body portion during manufacture. Barrels are also known, however, in which the tubular part of the barrel body portion and the end portions of the barrel are produced separately from one another. The end portions with the supporting and conveying rings thereon are produced by injection moulding and are welded onto the

tubular body portion of the barrel in a further step.

Because of the relatively thin wall adjacent the supporting and conveying rings, these rings are at a considerable risk from an oblique impact if a filled barrel is dropped from a height. A so-called deformation zone, which absorbs the main energy of impact, must be provided in front of the rings. This is achieved by arranging the rings at a distance below the top or above the base of the barrel. The portions of the barrel projecting axially beyond the annular groove taper inwardly towards the axis of the barrel.

In the case of an oblique or vertical impact of a falling barrel, the resilient end portions of the barrel projecting beyond the rings are deformed before the rings are impacted.

Because of the relatively short distance of the rings from the top or base of the barrel, when the barrel is rolled obliquely the handler can grasp the rings manually, so that an extremely convenient handling is provided.

When a filled barrel is rolled obliquely the edge of the base is pressed flat on account of the weight of the barrel, so that a damaging crushing action occurs. On

account of the support of the respective supporting and conveying ring against the base, the base edge deformation should be absorbed in part and so the damaging crushing action should be reduced.

The barrel is nevertheless prevented from rolling over the lower edge to an increasing extent. In addition, the edge area in the transition of the barrel body portion into the base portion is relatively thin and can be excessively stressed by rough handling, in particular during oblique rolling by hand. In addition, while tilting and rolling the barrel, the risk of accidents increases on account of the projecting rolling ring, under which the foot of the handler can be crushed.

Since only the upper supporting and conveying ring per se forms the abutment for a barrel gripping device by which the barrel is raised and lowered, the lower supporting and conveying ring is provided so as to be modified for a different function. In this connection, however, care must be taken to ensure that deformation forces are absorbed without damage in the event of a filled barrel being dropped.

To this end, the lower supporting and conveying ring must be modified to form a rolling ring and preferably occupy a slightly different position on the barrel.

The invention provides a barrel as claimed in claim 1.

It is evident from this that the lower deformation zone has been withdrawn so that the barrel can only be rolled via the rolling ring.

The impact energy generated during an oblique or vertical impact of a dropped barrel is directly absorbed by the rolling ring, which is bent inwards around the narrow connecting area on the barrel body portion and is resiliently deformed until it meets the tapered end portion and is supported there. In this way, the impact energy is dissipated by the deforming rolling ring.

Vertical stacking forces are absorbed by the rolling ring and by the base of the barrel, the forces being distributed by way of the tubular body portion of the barrel into the ring and by way of the tapered portion into the barrel base. The end face of the barrel base can be set back slightly with respect to the axial end face of the rolling ring in order to achieve a solid abutment on the storage floor.

If the barrel is rolled when positioned edgewise, it may be easily inclined. The diagonal loading which occurs when rolling over the edge can be better absorbed if the rolling ring is inclined slightly outwardly from the

bottom of the groove, with an extrapolation of the median axis passing through the cross-section of the ring and substantially intersecting the centre of gravity of the barrel. In this way, the rolling ring is substantially relieved of bending forces during rolling, so that as a result of only slight deformation a relatively narrowly limited floor contact is made possible, which assists rolling. The stacking forces are introduced into the barrel casing directly by way of the rolling ring.

Preferably, the rolling ring has a radially-outer end face having an outer diameter substantially equal to the outer diameter of the barrel body portion. Thus it is possible to palletize the barrel without loss.

Preferably, the rolling ring is provided with inner and outer, circumferentially-spaced, axially-extending reinforcing ribs at the portion of narrowest cross-section.

An embodiment of the invention will now be described by way of example with reference to the accompanying drawing, in which:

Fig. 1 is a side view of a bung barrel,

Fig. 2 is an enlarged cutaway section of the top end of the barrel of Fig. 1, and

Fig. 3 is an enlarged cutaway section of the base end of the barrel of Fig. 1.

In the drawing, a barrel 9 has a substantially cylindrical body portion 4, a top end face 10 and a bottom end face 7. Bungs (not shown) are provided in the barrel top.

An annular supporting and conveying ring 11, is situated adjacent the barrel top. The ring 11 is solid in cross-section and has a substantially radially-outwardly-extending, or substantially horizontal, abutment surface 13 and a substantially axially-extending, or substantially vertical, abutment surface 14 for the gripper arms (not shown) of a barrel gripping device.

The ring 11 is integrally connected to the body portion 4 by means of an annular connecting web 15 joined to the substantially horizontal abutment surface 13. An annular groove 16 is formed between the connecting web 15 and the end portion 12 of the barrel, which tapers inwardly in an upwards direction towards the top end surface 10 of the barrel. The base 17 of the groove 16

is arranged at a distance below the substantially horizontal abutment surface 13 of the ring 11.

The bottom of the barrel has an axial end face 5 terminating approximately in the plane of the barrel bottom 7, which merges into the substantially cylindrical body portion 4 by way of the tapered end portion 6.

The rolling ring 1 has an outwardly-tapering shape in cross-section. The narrowest portion of the rolling ring 1 is adjacent the annular groove 2' between the ring 1 and the tapered end portion 6. This not only enhances the weldability of the material during manufacture, but also provides a sort of hinge, so that the ring 1 can bend inwards under the action of lateral deformation forces. The ring 1 extends from the narrowest portion to the thickened end region. The radially-outer peripheral surface 3 of the ring 1 has substantially the same outer diameter as the cylindrical portion of the body portion 4, and therefore acts as a rolling surface.

As can be seen from Fig. 3, the rolling ring 1 is inclined outwards in a slightly tapered manner starting from the bottom 2 of the groove 2'. The extrapolation of the median axis 8, indicated with a dash-dot line and passing through the ring cross-section, intersects the

region of the centre of gravity (not shown) of the
barrel 9.



Claims:

1. A barrel of thermoplastic synthetic material having a rolling ring extending substantially axially from a body portion of the barrel adjacent a bottom end portion of the barrel tapering inwardly towards the barrel bottom, the rolling ring being radially spaced from the bottom end portion by an annular groove, wherein the rolling ring has an outwardly tapering cross-section with a narrowest portion adjacent the base of the groove and extending therefrom to a thickened end portion with an end face axially terminating substantially in the plane of the barrel bottom.
2. A barrel as claimed in Claim 1, wherein the rolling ring is inclined outwards from the bottom of the groove, so that an extrapolation of a median axis passing through the cross-section of the ring substantially intersects the centre of gravity of the barrel.
3. A barrel as claimed in Claim 1 or 2, wherein the rolling ring has a radially-outer end face having an outer diameter substantially equal to the maximum outer diameter of the barrel body portion so as to act as a rolling surface therewith when the barrel is on its side.
4. A barrel as claimed in any one of the preceding



Claims, wherein the rolling ring is provided with inner and outer, circumferentially-spaced, axially-extending reinforcing ribs at the portion of narrowest cross-section.

5. A barrel substantially as herein described with reference to the accompanying drawings.
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