

A coupling in accordance with the preamble of Claim 1 is known from GB-A-1 439 159. In this coupling, a bushing is welded into each of the two pipe ends which are to be connected. One bushing has a through bore, the other an internal thread. A screw which lies with its head on the inside of this bushing is passed through the through bore. A rectangular tube is pushed onto the screw and is welded to the screw. A ring having a square recess which has the same external diameter as the pipes and has one centring shoulder on each of its axial ends for insertion into the pipes is placed over the rectangular tube. By rotating this ring, the screw can be rotated and hence screwed into the female thread in the second bushing. This known pipe coupling is costly to assemble.

Another pipe coupling is known from GB-A-4598/1909. A pin with a projecting bar and an external thread on its shank is welded in one pipe. A nut is screwed on to the external thread. A bushing with an axial continuous elongated hole is welded in the second pipe. For coupling, the bar is passed through the elongated hole, the pipes are rotated by 90° to each other and finally the nut is tightened against the bushing. This coupling too is costly to produce and in addition requires rotation of the pipes relative to each other, which is undesirable in some applications.

It is the object of the present invention to provide a coupling which can be assembled quickly. This object is obtained by the characterising features of Claim 1.

An embodiment of the invention will be described below with reference to the drawings.

Fig. 1 shows an axial section through a pipe coupling,

Fig. 2 shows a section along line II-II in Fig. 1,

Fig. 3 shows a section alone line III-III in Fig. 1, and

Fig. 4 shows a perspective view of the connection point
of two column sections which are joined together
with couplings according to Figs. 1 to 3.

The coupling 1 illustrated in Figs. 1 to 3 connects two
coaxial pipes 2, 3 of the same circular cross-section by
their ends. The pipes 2, 3 each have two diametrically
opposed rectangular openings 5 adjacent to their end
faces 4. A first coupling section 6 is snapped into the
openings 5 of the pipe 2, and a second coupling section
7 is snapped into the openings 5 of the pipe 3.

The coupling section 6 consists of a bushing 10, a
coupling pin 11 and a ring 12. The bushing 10 is
divided into two identical halves in the plane of the
drawing of Fig. 2 which contains the axis 8 of the pipes
2, 3 and coupling 1, which halves are centred relative
to each other by two pegs 14 which engage in conical
holes 13 and project at right-angles to the plane of
separation. Each half of the bushing has a lug 16 which
projects past the cylindrical external circumference 15
of the bushing 10, said lug having a wedge surface 17
facing away from the ring 12 and a radial end face 18
facing the ring 12. The lug 16 is seated on a radially
resilient tongue 20 formed by longitudinal slits 19 and
having approximately the width of the associated opening
5, and is snapped into this opening 5. A hub section 21
of the bushing 10 surrounds a cylindrical shank 25 of
the coupling pin 11. The coupling pin 11 is mounted in

this hub section 21 so as to be rotatable and axially non-displaceable. In order to limit the angle of rotation of the coupling pin 11 to 90°, two stop lugs 27 are formed on the shank 25 adjacent to a head 26 of the coupling pin 11 which bears with its end on the bushing 10. Said lugs cooperate with corresponding stop surfaces 28 of the bushing 10 (Fig. 3).

At the opposite end, a hexagonal flange 29 of the coupling pin 11 bears on the hub section 21. The width across corners of this flange 29 is greater than the diameter of the head 26. The flange 29 is seated in a matching hexagonal recess 30 of the ring 12. Between the hexagonal flange 29 and the head 26, the ring 12 has a restriction 31 with an internal diameter which is smaller than the width across corners of the hexagonal flange 29, but greater than the diameter of the head 26. When the first coupling section 6 is inserted, therefore, the ring 12 thereof is held in its position by the flange 29. The ring 12 has two radial contact shoulders 32 which bear on the end faces 4 of the pipes 2, 3, and also on either side one conical centring shoulder 33 each which is inserted into the pipe ends. Between the contact shoulders 32 the ring 12 has two key surfaces 34. The ring 12 and hence the coupling pin 11 can be rotated by means of a key which engages in these surfaces. The ring 12 has two radial blind holes 35 offset at 90° to these key surfaces 34. The diameter of the ring 12 corresponds to the diameter of the pipes 2, 3 at least in the region of these blind holes 35.

The second coupling section 7, which is in one piece, is beaker-shaped and is secured in the pipe 3 in a similar manner to the two-part bushing 10 in the pipe 2. The coupling section 7 therefore likewise has two radially

resilient tongues 41, formed by longitudinal slits 40, with lugs 42 which are engaged in the openings 5 of the pipe 3. The end face of the base 43 of the coupling section 7 which projects into the interior of the pipe 3 forms a convex cylindrical contact surface 44 for a bar 45 of the coupling pin 11. The base 43 is breached by an axial elongated hole 46 through which the bar 45 fits. The supporting surface 47 of the bar 45 which faces the contact surface 44 is spherical and has the same radius of curvature as the contact surface 44. This configuration of bar 45 and base 43 yields a pull upon rotation of the coupling pin 11, so that the two pipes 2, 3 are wedged against the contact shoulders 32 of the ring 12. The bushing 10, the ring 12 and the second coupling section 7 expediently consist of a dimensionally stable, heavy-duty plastic, e.g. of polyamide, if necessary with fibre reinforcement.

The coupling described can be connected and detached again very quickly by rotating by 90°, and it has the advantage that it does not project beyond the diameter of the pipes 2, 3. The coupling described is particularly well suited for connecting column elements 53, 54, arranged vertically one above the other, for a space divider when the column elements 53, 54 consist of two vertical, spaced-apart pipes 2, 3 of circular cross-section which are connected together by horizontal connecting rods 55 (Fig. 4). The pipes 2, 3 of these column elements which are placed one on top of the other are connected together by one coupling 1 each. The columns 53, 54 bear separation elements, e.g. partitions, cupboard or drawer elements.

These separation elements stand on curved L-shaped tabular supports 60 made of sheet metal. The lower,

horizontal arm 61 of the support 60 has two indentations 62 in the form of segments of circles for contact with the two rings 12. From each of these indentations 62, a projection 63 protrudes which in the mounted state engages in the blind holes 35 of the rings 12. Two fingers 65 which are bent over by 180° are formed on the vertical arm 64. These fingers 65 in the assembled state grip around the connecting rods 55 and transfer the load on to these rods. The fingers 65 are asymmetrical and leave one gap 66 each open on one side and between them, which gap is wider than the width of the fingers. This means that two identical supports 60 can be suspended on the same connecting rod 55 mirror-inverted to the centre plane of the columns 53, 54. The fingers 65 of one support fit into the gaps 66 in the other support.

If the support 60 is used and a tabular object is placed on the support 60, this support is fixed and cannot be moved to either side. The support 60 secures the rings 12 as well at the same time. Furthermore, this configuration ensures that the couplings 1 are fully coupled, because if the rings 12 have not been rotated or have merely been partially rotated, the support 60 hangs askew and the relevant separating element cannot be used. The same supports 60 are also used on other heights of the columns 53, 54. To this end, the pipes 2, 3 have transverse bores corresponding to the blind holes 35 beneath each of the other connecting rods 55. Due to this additional use of the support 60, the rings 12 in the region of the blind holes 35 have the same diameter as the pipes 2, 3.

Claims

1. Coupling for the detachable connection of two coaxial pipes (2, 3) of equal diameter, with the coupling (1) consisting of a first coupling part (6) which is to be inserted into the end of one pipe (2) and a second coupling part (7) which is to be inserted into the end of the other pipe (3), whereby the first coupling part (6) comprises a bushing (10), a coupling pin (11) which is rotatable in the bushing (10) about the coupling axis (8) and extends along this axis (8), and also a coaxial ring (12) connected to the coupling pin (11) so as to be resistant to rotation and having one radial contact shoulder (32) in each case for the two end faces (4) of the pipes (2, 3) to bear on, and with one centring shoulder (33) in each case which can be inserted into the associated pipe end, and whereby the coupling pin (11) bears rotatably on the bushing (10) with a head (26), characterised in that the bushing (10) and the second coupling part (7) each have at least two radially resilient catch lugs (16, 42) for snapping into a corresponding number of openings (5) adjacent to the end face (4) of the pipes (2, 3), that the ring (12) has key engagement elements (34) between the contact shoulders (32), and that the coupling pin (11) at the end opposite the head (26) has a bar (45), the width of which is less than the width of an axial elongated hole (46) in the second coupling part (7), whereby the bar (45) engages behind the second coupling part (7) after the bar (45) is pushed through the elongated hole (46) and after the coupling pin (11) is rotated.



2. Coupling according to Claim 1, characterised in that the bushing (10) is divided along a plane containing the axis (8) into two identical parts, which are centred relative to each other at their parting plane by centring elements (13, 14).

3. Coupling according to Claim 2, characterised in that the coupling pin has a radial non-circular flange (29), the maximum radial dimension of which is greater than the radius of the head (26), that the flange (29) is inserted into a suitable recess (30) in the ring (12), and that the ring (12) has a restriction (31) with an axial through bore between the flange (29) and the head (26), the radius of which bore is greater than the head radius, but smaller than the maximum radial dimension of the flange (29).

4. Coupling according to one of Claims 1 to 3, characterised in that a cylindrical shank (25) of the coupling pin (11) is rotatably mounted in the bushing (10).

5. Coupling according to Claim 4, characterised in that a stop lug (27) projects from the coupling pin (11), and that stop surfaces (28) which cooperate with the stop lug (27) for limiting the angle of rotation of the coupling pin (11) to 90° are arranged in the bushing (10).

6. Coupling according to one of Claims 1 to 5, characterised in that the second coupling part (7) has a convex cylindrical contact surface (44) for the bar (45), with the axis of curvature of this contact surface (44) extending perpendicular to the coupling axis (8), and that the supporting surface (47) of the bar (45)



facing the contact surface (44) is approximately spherical.

5 7. Coupling according to one of Claims 1 to 6, characterised in that the ring (12) has two radial recesses (35) diametrically opposite each other.

10 8. Supporting column for a space divider, comprising a lower column element (53) and an upper column element (54), which are both formed by two vertical spaced-apart pipes (2, 3) connected together by horizontal connecting rods (55), with the two pipes (3) of the lower column element (53) each being connected to the two pipes (2) of the upper column element (54) by one coupling (1) according to Claim 6, and whereby in each case the first coupling part (6) is inserted into the upper pipe (2) and the second coupling part (7) into the lower pipe (3).

20 9. Space divider according to Claim 8, with a tabular support (60) consisting of a horizontal arm (61) for placing a tabular object on and a vertical arm (64) which merges at the top into fingers (65) bent over by 180° which are suspended on the connecting rod (55) directly above the couplings (1), with the horizontal arm (61) having two indentations (62) contacting the two rings (12) of the couplings (1), which indentations each have a projection (63) which engages in one of the recesses (35) of the ring (12).

