

The invention relates to an injection or compression mould according to the preamble of claim 1.

An injection or compression mould of this kind is known from the US-A-4 384 702. This mould entails the disadvantage that the marking insert is arranged inside the respective holding bore with a press fit and, if necessary, has to be driven out via an auxiliary bore by means of a tool. Although - in contrast to the known marking insert according to the DE-A-1 929 875 - that according to the US-A-4 384 702 is advantageously very compact, i.e. all the individual parts are comprised in a closed unit, the fact that the marking setting may be ambiguous due to incorrect operation represents a disadvantage.

Taking as a basis the marking insert according to the US-A-4 384 702, the object of the invention is to develop the known, compact marking insert, which represents a standard part, so as to simplify the fitting process and enable the setting operation to be carried out in a more accurate and easy manner. This object is solved according to the characterising part of claim 1.

The prime advantage of the marking insert according to the invention lies in the fact that, in connection with a more compact structure, it is now possible to arrange the locking adjustment unit, which - as opposed to the US-A-1 377 786, which is of a different category - permits an accurate setting, in the collar of the central member such that it is protected.

The structure according to the invention of the marking insert at the same time enables it to be arranged inside a stepped bore, which arrangement only requires a close fit - with the advantage of easy assembly and dismantling - rather than a disadvantageous press fit.

A further important feature of the marking insert according to the invention lies in the fact that the central member can be

adjusted in locking steps relative to the circular cylindrical ring member which surrounds it. In this respect the circular pitch of the locking steps is selected such that it is in alignment with the circular pitch of the markings. On the one hand the locking steps enable the required marking to be set accurately and unambiguously. On the other the locking forces between the locking elements, which positively interlock, are of a magnitude which prevents unintentional adjustment of a selected combination.

Further advantages of the invention are revealed in additional subclaims.

A preferred embodiment of the invention is illustrated in detail in the drawings, in which:

Figure 1 is an axial longitudinal section with the fitted position of a marking insert indicated diagrammatically, on a scale of 5:1,

Figure 2 is a view of the rear end face, on a scale of approximately 5:1, of the marking insert, which is shown separately, according to the arrow II in Figure 1, part of the central member being shown in section,

Figure 3 is an end view onto the front end face, which is provided with markings, of the marking insert, which is shown separately on a scale of 2:1, according to the arrow III in Figure 1.

In the drawings the marking insert is designated as a whole by the number 10.

The marking insert 10 comprises an outer ring member 11 and an inner central member 12. The ring member 11 is provided with a rear collar 13, to which a collar 14 of the central member 12 corresponds approximately in the same axial position. In order

to hold the central member 12 such that it can be interchanged, the ring member 11 comprises a stepped bore 15, the widened part 16 of which holds the collar 14 on the central member.

Both components 11 and 12 are essentially rotationally symmetrical, i.e. of a circular cylindrical shape. In order to fit the marking insert 10, the latter's central member 12 is pushed into the ring member 11 in the direction of the arrow II in Figure 1, the annular stop shoulder 17 forming a push-in limit.

Figure 1 shows how the marking insert 10 is held in a stepped through-bore 18 of a die block or mould insert 19. The mould insert 19 may either be of a thickness H_1 , as shown on the right-hand side in Figure 1, or a greater thickness H_2 , as shown on the left-hand side in Figure 1.

When the thickness is H_1 , the axial length of the marking insert 10, measured along its central axis of rotation x , is equal to the thickness H_1 of the mould insert 19. In order to be fitted the marking insert 10 is therefore pushed into the stepped bore 18 of the mould insert 19 in the direction of the arrow II in Figure 1. The mould retaining plate 20 is then fitted, which plate flushly supports the mould insert or die block 19 and the marking insert 10 at the back and positions the latter such that it is fixed in the axial direction inside the stepped bore 18. The widened part of the stepped bore 18 for holding the collar 13 on the ring member is designated by 21. The stop shoulder, which is formed by the stepped bore 18, for the collar 13 bears the reference number 22.

When the thickness of the mould insert is H_1 , a heavy-type dowel pin 23, which is indicated by broken lines in Figure 1, is provided to prevent the marking insert 10 from rotating. This pin is inserted in a radial blind-end bore 24, which is open to the outside, in the collar 13 and at the same time engages in a recess 25, which is indicated by broken lines in Figure 1 and

open towards the mould retaining plate 20, in the mould insert 19. The cross width of the recess 25 corresponds to the outer diameter of the heavy-type dowel pin 23.

When the thickness of the mould insert 10 is H_2 , a distance disk 26 has to be inserted in the rear area of the stepped bore 18, which disk flushly bridges the remaining space up to the mould retaining plate 20. In this case another heavy-type dowel pin 27, which is inserted in an axial bore 28 in the collar 13, is firstly provided to prevent the marking insert 10 from rotating. The heavy-type dowel pin 27 at the same time engages in a recess 29, which is open towards the marking insert 10, in the edge area of the distance disk 26. The cross width of the recess 29 is adapted to the outer diameter of the heavy-type dowel pin 27. Finally, the distance disk 26 is secured by means of an insertion piece 30, which is inserted in a recess 31 formed by both the mould insert 19 and the distance disk 26.

An insert 32 is provided in the collar 14 of the central member 12 for the rotational adjustment of the central member 12 in locking steps, which insert comprises a spring-mounted locking ball 33 and, as it is provided with an external thread 34, is screwed into a radial tapped through-hole 35 inside the collar 14. The axial set position of the insert 32 is secured by a set screw 36, which is held in the collar 14 and extends at a right angle to the hole 35.

The locking ball 33 cooperates with locking recesses 37, each having a part-circular cylindrical cross section and being provided at the inner surface of the collar 13 on the ring member. As can be seen from Figure 3, the inner surface of the ring member 13 comprises seven locking recesses 37, which are associated in an aligned manner with different year numbers 85-91. The locking recesses 37 can be produced relatively simply either by means of a milling cutter or a drill.

The year numbers 85-91 form markings 38, which are fixed in

space, to which markings a rotational marking 39 can be related and the set combination secured by the locking ball 33 engaging in a certain locking recess 37. The end faces which bear the markings 38, 39, which form the mould, are designated by 40 (annular front end face, fixed in space, of the ring member 11) and 41 (rotational, completely circular front end face of the central member 12).

The end faces 40, 41 thus form a component of the engraving G of the mould insert 19, which defines the mould cavity designated by H_F .

Since, as in the present case, the marking 39, which is rotationally adjustable and at the same time formed as an arrow, forms a slot for the blade of a screwdriver, the central member 12 can be moved relatively easily into another set position from the cavity H_F when the mould is open. According to Figure 1 further markings 42, which form the mould, are provided within the end face 41 and - being arranged in the form of rays - have more of a decorative nature.

The rear end faces 43, 44 of the ring member 11 and the central member 12, respectively, are arranged flush with one another, with the rear end face 44 of the central member 12 also being provided with an engagement slot 45 for the blade of a screwdriver. If necessary, a reverse rotational adjustment of the central member 12 is thus also possible - once the mould retaining plate 20 has been removed.

It is obvious from the above statements that the marking insert 10 forms a standard part which can easily be fitted. In this respect it should also be borne in mind that the central member 12 can cooperate with ring members 11 of different structures in its described or in a similar form. Diverging from the illustrated embodiment, the front end face 40 of the ring member 11 can thus be provided with twelve month numbers and - adapted to these - with twelve locking recesses 37.



Claims

1. Injection or compression mould for processing plastic materials, in particular synthetic materials, with a marking insert (10), which comprises an outer circular cylindrical ring member (11), which can be fixed in space in a holding bore (18) of a mould insert (19) and whose circular end face (40), which is flush with the adjacent mould wall (G) of the mould insert (19), comprises a first marking (38) which forms the mould, a circular cylindrical central member (12) being arranged such that it can be rotated and fixed coaxially in the ring member (11), the end face (41) of which central member, which can rotate with the latter and is flush with the adjacent end face (40) of the ring member (11) and the adjacent mould wall (G), comprises a second marking (42) which forms the mould, the ring member (11) forming a widened part (16) of a stepped bore (15) with an annular stop shoulder (17) in its axial area which is distant from the engraved surface (G) for holding the central member (12), on which shoulder a rear collar (14), which is distant from the mould wall (G), of the central member (12), is supported, characterised in that the rear axial area of the ring member (11) is also formed as a collar (13) to hold the collar (14) on the central member, the holding bore (18) inside the mould insert (19) being formed as a stepped bore (18) so as to conform to the external shape of the ring member (11), and a resilient thrust piece (32) with a locking ball (33) being inserted in a hole (35), which passes radially through the collar (14) of the central member (12), for the rotational adjustment of the central member (12) in locking steps, which ball cooperates with locking recesses (37), which are provided at the inner surface of the ring member (11) and the number of which corresponds to that of the markings which can be set.

2. Injection or compression mould according to claim 1, characterised in that the insert (32) can be secured by means of a set screw (36), which is arranged at a right angle to the tapped hole (35) in the central member (12).



3. Injection or compression mould according to claim 1 or 2, characterised in that the front end face (41) of the central member (12) is only provided with one marking (39), which is arranged centrally, extends radially and at the same time forms operating surfaces for an adjusting tool, e.g. for the blade of a screwdriver.

4. Injection or compression mould according to one of claims 1 to 3, characterised in that the rear end face (44), which is distant from the engraved surface (G), of the central member (12) is also provided with operating surfaces for an adjusting tool, for example with a slot (45) for the blade of a screwdriver.