

MOULD SEGMENTS WITH INDEXING MEANS AND METHOD OF ALIGNING MOULD SEGMENTS

BACKGROUND OF INVENTION

5 1. Field of invention

This invention relates generally to mould segments of a mould matrix used in the production of replacement premoulded and precured tyre thread in a flat moulding process. The mould segments in this invention is provided with an indexing means to align adjacent mould segments in a mould matrix so as to eliminate misalignment of
10 mould segments which would cause aberration, discontinuity or distortion in the tyre thread pattern of replacement premoulded and procured tyre thread for installation on a prepared tyre casing. The invention also relates to a method of aligning mould segments in a mould matrix using indexing means located on the opposing longitudinal edges of the mould segments.

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2. Discussion on related art

In the production of replacement premoulded and precured tyre thread, a flat press is generally used. The flat press generally has an upper platen and a lower platen (30), both made of heat conducting materials such as steel or aluminium. Referring to
20 Fig. 1, during setting up stage in the production of replacement premoulded and precured tyre thread, a plurality of mould segments with generally repeating thread pattern are placed side by side one another to form into a mould matrix that sits on the lower platen (30) of a flat press in a space defined between two guide bars (32). The number of mould segments required to form the matrix depends on the length of
25 replacement premoulded and precured tyre thread needed to be able to securely wrap the replacement tyre thread around the tyre casing to be retreated such that two ends of the tyre thread contact each other in an acceptable manner. Once the mould segments of a mould matrix are loaded in place, a clamp bar (33) is placed longitudinally across mould matrix on the shoulders (24) of the plurality of mould
30 segments and the guide bar (32). Each clamp bar (33) rests on the guide bar (32) and the shoulders (24) of the mould segments. Removable fasteners (35) removably secure each of the guide bar (32) and clamp bars (33) to the lower platen (30) of the flat press. The clamp bars (33) in turn secure the mould segments to the lower platen (30) of the flat press.

The thread pattern is defined by the cavity of the mould segments. In a changeover to the production of another thread pattern, the mould segments on the lower platen (30) are removed and replaced with mould segments defining other thread patterns.

5 To begin the moulding process, a rubber blank is placed on the cavities (11) of the mould segments of the mould matrix and between the mould walls (12, 13) of the mould segments. The upper platen then moved vertically downwards and presses on the rubber blank, imprinting a thread pattern onto the rubber blank in the curing and vulcanization process. The moulding process requires the upper platen and the lower
10 platen (30) of the flat press to be heated and maintained at a very high temperature, typically in excess of 300° F. The thermal expansion of the guide bars (32), the clamp bars (33) and the mould segments requires that expansion gaps (41, 42, 43, 44) be provided for between the mould walls of each of the mould segments and the walls of the guide bars (32), and that of the clamp bars (33) proximate to the mould walls.

15 There must be sufficient allowance for expansion gaps (41, 42, 43, 44). This is to ensure that there is no compression force exerted on the edges of the mould segments as a result of thermal expansion of the mould segments, guide bars (32) and clamp bars (33). The compression force may cause distortion to the mould cavity (11). Further, during the changeover to the moulding of another tyre thread pattern, the
20 mould segments can be readily removed if the expansion gaps allowance is sufficient. Otherwise, thermal expansion may result in interference fit between the edges of the mould walls of the mould segments and the guide bars (32), resulting in the operator of the flat press having to wait for the temperature to drop before the mould segments could be removed and replaced with other mould segments defining other thread
25 patterns in a change over set up procedure.

Ideally the mould segments should be arranged to sit on the lower platen (30) so that the expansion gap (say 41) is fixed and constant between the edges of the mould walls of each of the plurality of mould segments and the guide bars (32). In practice, it is time consuming and very difficult for the operator loading and aligning
30 the mould segments in a change over procedure to ensure that the expansion gaps (41, 42, 43, 44) are fixed and constant for all mould segments in the mould matrix. In addition, in the course of moulding, there could be relative movements of the mould segments caused by pressing action of the upper platen as well as during the process of removing the replacement premoulded and precured tyre thread from the lower

platen (30). If the expansion gaps are not fixed and uniform, the replacement premoulded and precured tyre thread will exhibit misaligned or distorted thread pattern as shown encircled in sections A and B in Fig. 2, which is an abridged view of replacement premoulded and procured tyre thread from three mould segments. The dotted lines in Fig. 3 merely show the boundary of each of the three mould segments.

It is therefore desirable to provide an indexing means for the mould segments of a mould matrix so as to eliminate misalignment between adjacent mould segments so as to avoid displaced or distorted thread pattern in the replacement premoulded and precured tyre thread.

In one prior art, as shown in Fig. 2, the base of each mould segment is provided with a keyway (71). A key guide that matches the dimension of the keyway (71) is provided on the lower platen (30) of the moulding machine so that when the mould segments are loaded onto the lower platen (30), the keyway (71) fits matingly and rest on the guide. In this way, the mould segments could be aligned to one another.

However, if the keyway (71) of a mould segment is not resting properly on the key guide, this raised segment is likely to break under the pressing force from the upper platen of the flat press. A mould segment may be dislodged or raised up in several situations. The first situation is caused by human error of the operator in not aligning the keyway (71) properly onto the key guide during loading of the mould segments in a changeover set up procedure. The second situation is when waste rubber crumb left at the intersection edge between the key guide and the lower platen (30) from the preceding moulding operation obstructed the keyway (71) of the mould segment from sitting properly onto the key guide during a changeover of mould segments. The third situation is the dislocation of a mould segment caused by the removal of the replacement premoulded and precured tyre thread after a moulding process.

SUMMARY OF INVENTION

In order to overcome the shortcoming outlined above, each of the opposing longitudinal edges of a mould segment is provided with at least one indexing means to align the mould segment with adjacent mould segments. The indexing means may comprise one or more protruded portions, or one or more indented portion, or a combination of one or more protruded portions and one or more indented portions on the longitudinal edges of the mould segment.

When the indexing means comprises a protruded portion, the complementary indexing means on the abutting longitudinal edge of an adjacent mould segment is a correspondingly positioned indented portion on that abutting longitudinal edge, with the indented portion matingly receiving the protruded portion. When the indexing means comprises an indented portion, the complementary indexing means on the abutting longitudinal edge of an adjacent mould segment is a correspondingly positioned protruded portion on that abutting longitudinal edge of the adjacent mould segment, with the protruded portion matingly received into the indented portion on the longitudinal edge of the mould segment.

The protruded portion and the indented portion may be of any shape but of complementary shape and configuration. When viewed from the top, the protruded and indented portions may have the shape of a trapezium, a trapezoid, a semi-circle, an oblong or any other suitable shape. From mould fabrication and from replacement tyre thread production point of views, the protruded and indented portions are preferably located on that part of the longitudinal edge making up part of the mould walls and of a shape that could be machined without much difficulty. When the protruded portion and indented portion, as viewed from the top, are trapezium shaped and located at the end of the mould wall, there is preferably a slanted edge the leg of the trapezium distal from the edge of the mould wall to guide the protruded portion and the correspondingly positioned complementary indented portion on the longitudinal edge of the abutting adjacent mould segment into position during set up of the mould matrix in a moulding process. Similarly, the indented portion has a complementary slanted edge for the same purpose.

The invention also relates to a method of aligning mould segments in a mould matrix using indexing means on the opposing longitudinal edges of the mould segments.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawings, not to scale, constitute part of this specification and include preferred embodiments of the invention. In the appended drawings:

Fig. 1 shows the set up of a mould segment for the production of replacement premoulded and precured tyre thread on a flat press.

Fig. 2 shows a section of the replacement premoulded and precured tyre thread corresponding to three mould segments when the mould segments were not properly aligned.

Fig. 3 shows the cross-sectional view of a mould segment of prior art with a keyway on the base for indexing purpose.

Fig. 3a shows a perspective view of a conventional mould segment without indexing means or with indexing means at the base.

Fig. 4 shows a perspective view of a mould segment of this invention with one longitudinal edge having a protruded portion and the other longitudinal edge having a correspondingly positioned indented portion.

Fig. 5 shows the top view of a mould matrix made up from a plurality of mould segments of Fig. 4.

Fig. 6 shows the top view of another mould matrix made up from a plurality of mould segments with one protruded portion on one longitudinal edge and one indented portion on another longitudinal edge with the protruded and indented portions of semi-circular shape.

Fig. 7 shows the top view of another mould matrix made up from a plurality of mould segments with one protruded portion on one longitudinal edge and one indented portion on another longitudinal edge, with the protruded portion and indented portion located away from the mould wall.

Fig. 8 shows a perspective view of a mould segment of this invention with one longitudinal edge having two protruded portions and the other longitudinal edge having two correspondingly positioned indented portions.

Fig. 9 shows the top view of a mould matrix made up from a plurality of mould segments of Fig. 8.

Fig. 10 shows another mould matrix made up from a plurality of alternating mould segments, one with four protruded portions and the other with four indented portions on the longitudinal edges of the mould segments.

Fig. 11 shows yet another mould matrix made up from mould segments with a combination of protruded and indented portions on each of the longitudinal edges.

DETAILED DESCRIPTION OF THE INVENTION

A detailed description of preferred embodiments of the invention is disclosed herein. Hereinafter, identical part of the mould segment representing different

embodiments of the invention is designated by the same reference numeral. In the case of adjacent mould segments, adjacent mould segments and its parts are designated by the same reference numerals but with a single prime (') or double prime (") added. For example, the mould segment is designated (1), the adjacent mould segments are designated (1') and (1"). In the case of parts, for instance, 16, 16' and 16" designate the same part on different mould segments (1, 1' and 1" respectively). Similarly 18, 18' and 18" are the same part on different mould segments (1, 1' and 1" respectively) and so on. The single prime (') or double prime (") is added to the reference numerals merely to facilitate the description and understanding of the invention and not to indicate that the adjacent mould segments are different

Fig. 3a shows a conventional mould segment (1) used in the production of replacement premoulded and precured tyre thread. The mould segment (1) comprises a base (8), a first and a second opposing mould walls (12, 13) at each end of the base (8), a first and second opposing longitudinal edges (14, 15), a mould cavity (11) between the mould walls (12, 13).

The base (8) has a base back (19), a base front (17) and longitudinal edges forming part of the first and second opposing longitudinal edges (14 and 15) of the mould segment (1).

The first and a second opposing mould walls (12, 13) are located at the respective ends of the base (8) and rising from the base front (17). Each opposing mould walls (12, 13) has an inner surface (21), an outer surface (22), a contact surface (23), a shoulder (24) and longitudinal edges forming part of the first and second longitudinal edges (14 and 15) of the mould segment (1).

The mould cavity (11) is located on the base front (17) and between the opposing mould walls (12, 13). The mould cavity (11) defines the thread pattern of the replacement premoulded and precured tyre thread.

The material used in the manufacturing of the mould segments is generally aluminium because of its workability. Preferably, the mould cavity (11), the opposing mould walls (12, 13) and the base (8) are cast as an integral unit.

In moulding operation, a plurality of mould segments is secured to the lower platen (30) of the flat press with the use of clamp bars (33) which clamp the shoulders (24) of the first and second opposing mould walls (12, 13) of the plurality of mould segments and the guide bars (32) to the lower platen (30) of the flat press. A removable fastener (35) removably secures each of the guide bars (32) and clamp bars

(33) to the lower platen (30) of the flat press. A plurality of such mould segments when placed adjacent to one another forms a mould matrix on the flat press.

Fig. 4 and Fig. 5 show an intermediate mould segment (1) of a mould matrix of this invention. The mould segment (1) has a protruded portion (16) on the first longitudinal edge (14) and an indented portion on the second longitudinal edge (15) serving as indexing means. The complementary indexing means on the second longitudinal edge (15') of the adjacent mould segment (1') is a correspondingly positioned indented portion (18') on the second longitudinal edge (15') of the adjacent mould segment (1'), with the indented portion (18') matingly receiving the protruded portion (16). The complementary indexing means on the first longitudinal edge (14'') of the adjacent mould segment (1'') is a correspondingly positioned indented portion (18'') on the first longitudinal edge (14'') of the adjacent mould segment (1''), with the indented portion (18'') matingly receiving the protruded portion (16).

It is obvious to someone skilled in the art that the mould segment (1) could have an indented portion (18) on the first longitudinal edge (14) and a protruded portion on the second longitudinal edge (15). In this case, the complementary indexing means on the adjacent mould segment (1') is a correspondingly positioned protruded portion (16') on the second longitudinal edge (15') of the adjacent mould segment (1'), with the protruded portion (16') matingly received into the indented portion (18) on the first longitudinal edge (14) of the mould segment (1). The complementary indexing means on the first longitudinal edge (14'') of the adjacent mould segment (1'') is a correspondingly positioned indented portion (18'') on the first longitudinal edge (14'') of the adjacent mould segment (1''), with the indented portion (18'') matingly receiving the protruded portion (16).

Fig. 6 and Fig. 7 show another two examples of an intermediate mould segment (1) of a mould matrix with a protruded portion (16) on one longitudinal edge (14 or 15) and an indented portion on the other longitudinal edge (15 or 14).

The protruded and indented portions (16, 18) are preferably located at the end of the mould wall (12 or 13) but may also be located away from the mould wall (12 or 13). Fig. 5 and Fig. 6 show examples of a mould segment (1) where the protruded portions (16) and indented portions (18) are provided on that part of the opposing longitudinal edge (14 or 15) making up part of either the first or the second opposing mould wall (12 or 13) of the mould segment (1). Fig. 7 shows an example of a mould segment (1) where the protruded portions (16) and indented portions (18) are provided

on that part of the opposing longitudinal edge (14 or 15) making up part of the base (8) of the mould segment (1).

The protruded portion (16) and the indented portion (18) may take any shape or profile but preferably take a shape and profile that facilitate machining work in mould fabrication and facilitate the set up of the mould matrix in a moulding process. The shape of the protruded portion (16) and the indented portion (18), as viewed from the top, may for example be of semi-circular shape, as shown in Fig. 6, of trapezium shape, as shown in Fig. 4, Fig. 5 and Fig. 7, of trapezoid shape, of oblong shape or of any other suitable shape. In this description, trapezium is taken to mean a quadrilateral with a pair of parallel bases and two legs while trapezoid defines a quadrilateral without any parallel sides. It should be noted that the trapezium shape, as viewed from the top, actually comprises a rectangular or square and a smaller trapezium. The rectangular or square is represented by the protruded portion (16) or indented portions (18) of the shoulder (24) of the mould wall (12 or 13), while the smaller trapezium is represented by the protruded portion (16) or the indented portion (18) of the contact surface (23) of the mould wall (12 or 13).

The mould segment (1) could have more than one protruded portions (16) on one longitudinal edge (14 or 15) and a corresponding number of indented portions (18) on the other longitudinal edge (15, 14). Fig. 8 and Fig. 9 shows an example of a mould segment (1) with two protruded portions (16) and two indented portions (18), one protruded portion (16) each and one indented portions (18) each is provided on each of that part of the longitudinal edge (14, 15) making up part of each mould wall (12, 13). Although the shape of the protruded portions (16) and indented portions (18), as viewed from the top, is shown as a trapezium in Fig. 8 and Fig. 9, the shape of the protruded portion (16) and the indented portion (18) may be any other shape such as semi-circular, trapezoid, oblong and so on. On the same note, although the protruded portions (16) and indented portions (18) are shown located as that part of the longitudinal edge (14, 15) making up part of the mould walls, (12, 13), the protruded portions (16) and indented portions (18) may also be located away from the mould walls (12, 13).

The examples illustrated so far include intermediate mould segments (1) of identical shape and configurations. Fig. 10 shows an example where adjacent mould segments are of different shape and configuration but alternating mould segments are of the same shape and configuration. In this example, one of the mould segments (1a)

has protruded portions (16) on both longitudinal edges (14 and 15) and the adjacent mould segments (1b) have correspondingly positioned indented portions on both longitudinal edges (14 and 15). The number of protruded portions (16) and indented portions (18), as illustrated in Fig. 10, is two each on each longitudinal edge (14 or 15). However, Fig. 10 is used merely as an illustrative example to explain the invention. In practice, the number of protruded portions (16) and indented portions (18) on each longitudinal edge (14 or 15) on adjacent mould segments (1a and 1b) may be one or more. It should be noted that when mould segment (1a) and mould segment (1b) are viewed integrally, it has the same shape and configuration of a mould segment (1) shown in Fig. 9. Although the protruded portions (16) and indented portions (18) are shown at the end of the mould wall (12, 13) in Fig. 10, the protruded portions (16) and indented portions (18) can be located away from the mould walls (12, 13).

The indexing means of the mould segment (1) may comprise a combination of one or more protruded portions (16) and one or more indented portions (18) on the longitudinal edges (14, 15) of the mould segment (1). Fig. 11 illustrates an example where the mould segment (1) has two protruded portions (16) and one indented portion (18) on one longitudinal edge (14), and two indented portion (18) and one protruded portion (16) on the other longitudinal edge (15). The positions of the protruded portions (16) are such that they mate with correspondingly positioned indented portions (18' or 18'') on the longitudinal edge (16' or 18'') of adjacent mould segments (1', 1''). The same treatment applies with respect to the positioning of indented portion (18) on the mould segment (1).

If the protruded portion (16) and indented portion (18) are located at the end of the mould wall (12 or 13) and of trapezium shape (see Fig. 5, Fig. 8, Fig. 9 and Fig. 10), as viewed from the top, the leg of the trapezium distal from the mould end is preferably slanted. This slanted edge (28) provides a means to guide the protruded portion (16) and the correspondingly positioned complementary indented portion (18') on the longitudinal edge (15) of the abutting adjacent mould segment (1') into position during set up of the mould matrix in a moulding process. The same treatment applies to the indented portion (18) of mould segment (1) and the complementary protruded portion (16'') of the adjacent mould segment (1''). If the protruded portion (16) and indented portion (18) are located at that part of the longitudinal edge (14 or 15) making up part of the base (8) of the mould segment (1) (see Fig. 7 and Fig. 11), both

legs of the trapezium are preferably slanted and the trapezium is preferably isosceles trapezium. Again the slanted edges (28) provide a means to guide the protruded portion (16) of the mould segment (1) and the correspondingly positioned complementary indented portion (18'') of the adjacent mould segment (1''), and the
5 indented portion (18) of mould segment (1) and the complementary protruded portion (16') of the adjacent mould segment (1') into position during set up of the mould matrix in a moulding process.

Further, the protruded portion (16) on the longitudinal edge (14 or 15) of the mould segment and the correspondingly positioned indented portion (18' or 18'') on
10 the longitudinal edges (15' or 14'') of the adjacent mould segment (1' or 1'') are of complimentary shape and configuration and the indented portion (18) on the longitudinal edge (14 or 15) of the mould segment (1) and the correspondingly positioned protruded portion (16' or 16'') on the longitudinal edges (15' or 14'') of the adjacent mould segment (1' or 1'') are of complimentary shape and configuration.

15 Although the protruded portions (16) are shown in the drawings as formed integrally with the mould segment (1), it is understood by someone skilled in the art that it could be a separate unit attached to the longitudinal edge (14, 15) using any suitable means.

Indexing means is generally not necessary on the longitudinal edges at the
20 extreme ends of the mould matrix. For instance, for the mould segments (1''' Figs. 5, 6 and 8 to 11), the longitudinal edge (14''') do not need to have protruded portions.

Further, it is possible that an indented portion is provided on that part of the longitudinal edge (14, 15) making up part of the mould wall (12, 13) without a complementary protruded portion provided on the longitudinal edge (15' or 14'') of
25 the adjacent mould segment (1' or 1'' respectively). Such an indented portion without a corresponding protruded portion is not regarded as indexing means in the context of this invention.

The invention also covers the method of aligning mould segments in a mould matrix by using the mould segment (1) as described hereinbefore.

30 The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the principle and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of following claims.

CLAIMS

1 A mould segment (1) of a mould matrix used in the production of replacement premoulded and precured tyre thread, the mould segment (1) comprising:

5 a first and a second opposing longitudinal edges (14, 15);

a base (8), the base (8) comprising a base back (19), a base front (17) and edges forming part of the first and second opposing longitudinal edges (14, 15) of the mould segment (1);

10 a first and a second opposing mould walls (12, 13) at each end of the base (8) and rising from the base front (17), each opposing mould walls (12, 13) comprising an inner surface (21), an outer surface (22), a contact surface (23), a shoulder (24) and edges forming part of the first and second longitudinal edges (14 and 15) of the mould segment (1);

15 a mould cavity (11) on the base front (17) and between the opposing mould walls (12, 13) with the mould cavity (11), the opposing mould walls (12, 13) and the base (8) forming an integral unit;

wherein each of the opposing longitudinal edges (14, 15) of the mould segment (1) is provided with at least one indexing means to align the mould segment (1) with adjacent mould segments (1', 1'');

20 wherein the indexing means comprises one or more protruded portions (16) or one or more indented portion (18) or a combination of one or more protruded portions (16) and one or more indented portions (18) on the longitudinal edges (14, 15) of the mould segment (1);

25 wherein when the indexing means comprises a protruded portion (16) on the first longitudinal edge (14) of the mould segment (1), the complementary indexing means is a correspondingly positioned indented portion (18') on the second longitudinal edge (15') of the adjacent mould segment (1'), with the indented portion (18') matingly receiving the protruded portion (16);

30 wherein when the indexing means comprises an indented portion (18) on the first longitudinal edge (14) of the mould segment (1), the complementary indexing means is a correspondingly positioned protruded portion (16') on the second longitudinal edge (15') of the adjacent mould segment (1'), with the protruded portion (16') matingly received into the indented portion (18) on the first longitudinal edge (14) of the mould segment (1);

wherein when the indexing means comprises a protruded portion (16) on the second longitudinal edge (15) of the mould segment (1), the complementary indexing means is a correspondingly positioned indented portion (18'') on the first longitudinal edge (14'') of the adjacent mould segment (1''), with the indented portion (18'')
5 matingly receiving the protruded portion (16); and

wherein when the indexing means comprises an indented portion (18) on the second longitudinal edge (15) of the mould segment (1), the complementary indexing means is a correspondingly positioned protruded portion (16'') on the first longitudinal edge (14'') of the adjacent mould segment (1''), with the protruded portion (16'')
10 matingly received into the indented portion (18).

2 A mould segment (1) of a mould matrix used in the production of replacement premoulded and precured tyre thread as in claim 1,

wherein the protruded portion (16) on the longitudinal edge (14 or 15) of the
15 mould segment and the correspondingly positioned indented portion (18' or 18'') on the longitudinal edges (15' or 14'') of the adjacent mould segment (1' or 1'') are of complimentary shape and configuration; and

wherein the indented portion (18) on the longitudinal edge (14 or 15) of the mould segment (1) and the correspondingly positioned protruded portion (16' or 16'')
20 on the longitudinal edges (15' or 14'') of the adjacent mould segment (1' or 1'') are of complimentary shape and configuration.

3 A mould segment (1) of a mould matrix used in the production of replacement premoulded and precured tyre thread as in claim 1, wherein the protruded
25 portions (16) and indented portions (18) are provided on that part of the opposing longitudinal edge (14 or 15) making up part of either the first or the second opposing mould walls (12 or 13) of the mould segment (1).

4 A mould segment (1) of a mould matrix used in the production of
30 replacement premoulded and precured tyre thread as in claim 1,

wherein the indexing means provided on one of the longitudinal edge (14 or 15) of the mould segment (1) comprises only protruded portion or protruded portions (16); and

wherein the indexing means provided on the other longitudinal edge (15 or 14) comprises only indented portion or indented portions (18).

5 A mould segment (1) of a mould matrix used in the production of replacement premoulded and precured tyre thread as in claim 4,

wherein one protruded portion (16) each is provided on that part of the longitudinal edge (14 or 15) making up part of each mould wall (12, 13), and one indented portions (18) each is provided on that part of the other longitudinal edge (15 or 14) making up part of each mould wall (12, 13).

10 6 A mould segment (1) of a mould matrix used in the production of replacement premoulded and precured tyre thread as in claim 5, wherein the protruded portion (16) or the indented portion (18) is provided at the end of the mould wall (12 or 13).

15 7 A mould segment (1) of a mould matrix used in the production of replacement premoulded and precured tyre thread as in claim 1 or 6, wherein the protruded portion (16) and indented portion (18), as viewed from the top, are of trapezium shape having two parallel bases or of semi-circular shape or of oblong shape or of any suitable shape.

25 8 A mould segment (1) of a mould matrix used in the production of replacement premoulded and precured tyre thread as in claim 7, wherein when the protruded portion (16) is trapezium shaped, there is provided a slanting edge (28) to guide the protruded portion (16) into position into the correspondingly positioned complementary indented portion (18' or 18'') on the longitudinal edge (15' or 14'') of the adjacent mould segment (1' or 1'' respectively).

30 9 A mould segment (1) of a mould matrix used in the production of replacement premoulded and precured tyre thread as in claim 7, wherein when the protruded portion (16) is an isosceles trapezium, as viewed from the top, there is provided slanting edges (28) to guide the protruded portion (16) into position into the correspondingly positioned complementary indented portion (18' or 18'') on the longitudinal edge (15' or 14'') of the adjacent mould segment (1' or 1'' respectively).

10 A method of aligning mould segments in a mould matrix using the mould segment (1) of claims 1 to 9.