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Production method for concrete pillar.

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Description

The present invention relates to a method for producing a concrete pillar, in which method the concrete mix is cast in a mould, and after the hardening of the mix, it is cut.

A related method for producing concrete elements is described, e.g., in the Finnish patent application 2016/69, according to which a cast concrete block is divided by cutting into planar slabs to be used as stepping levels of stairs. The GB patent 1,474,717 discloses a grinding method of a ceramic block, whereby said method achieves a ceramic piece with a circular cross section through grinding by different shapes of grinding wheels. Also such patent publications as the DE patent 673,520, FI patent 80400 and FI patent application 875752 relate to methods for producing concrete elements, but all of these are based on cutting or processing the concrete mix prior to its hardening. The patent application publication DE-3521 199 A1 describes a production method for an element with a circular cross section, in which method a pipe-like shell is cut by sawing from a natural stone block, after which the shell is filled with concrete mix and reinforcing steels.

It is an object of the present invention to achieve a novel production method for a concrete pillar. The production method according to the invention is characterized by the following combination of work phases:

- centering elements, such as a full-length hollow pipe, are mounted in the mould; reinforcing steels are optionally placed about the centering element; and
- concrete mix is introduced into the mould, the mix is allowed to harden and dry, the concrete pillar element is stripped free from the mould, the concrete pillar element is centered in a cutting unit of the concrete element, the sides of the concrete pillar element are cut by sawing so as to attain a pillar of desired cross section.

The invention achieves in a straightforward manner a pillar of desired cross section and excellent dimensional accuracy. The cutting method by sawing according to the invention completely replaces conventional diamond grinding. The cut concrete surface can additionally be ground after cutting by sawing to a high polish if a glossy surface is desired. According to an embodiment of the invention, the concrete pillar is cut by sawing to attain a cross section shaped as a square, hexagon, octagon, etc. The pillar to be cut by sawing is first rotated about the centered axis to a correct angle and then cut by sawing.

An embodiment of the invention is characterized in that the concrete pillar is cut by sawing to a conical shape. For this purpose, the concrete pillar to be cut by sawing is aligned to an angle with respect to the linear path of the cutting saw.

Another embodiment of the invention is characterized in that a plurality of adjacently placed centering elements are enclosed by casting in a common mould so that several pillars can be obtained from a single mould by separating the pillars by cutting with a saw from the cast concrete element. This approach can provide significant time savings in the production of concrete pillars.

A further embodiment of the invention is characterized in that the concrete pillar is processed by cutting with a saw to incorporate grooves for the mounting of wall panel elements. This provides a stable mounting of the wall elements without the use of additional fixing elements.

Further, another embodiment of the invention is characterized in that the concrete mix is filled with stone aggregates of 30...100 mm diameter, whereby the stones are cut during the cutting phase with a saw thus producing a decorative surface. Such a cut stone surface has a unique and attractive appearance.

In the following, the invention is examined with the help of an exemplifying embodiment by making reference to the attached drawings, in which

Figure 1 shows the casting mould in a section illustrating the placement of the centering pipe and the reinforcing steels,

Figure 2 shows the casting mould in a section illustrating the placement of four adjacent centering pipes of concrete pillars with their reinforcing steels,

Figure 3 shows the same configuration as Fig. 2 after the filling of the mould with the concrete mix and separation of the concrete pillars by cutting with a saw,

Figure 4 shows the same configuration as Fig. 3 in a top view,

Figure 5 shows the cutting of a concrete pillar with octagonal cross section,

Figure 6 shows the saw-type cutting apparatus for the concrete pillars,

Figure 7 shows the cross section of a square-shaped pillar,

Figure 8 shows an octagonally cut pillar with a conical shape,

Figure 9 shows the cross section of square pillar,

Figure 10 shows the cross section of a cruciform pillar, and

Figure 11 shows the cross section of a pillar with saw-cut mounting grooves for wall panel elements.

The production of a concrete element 1 takes place as follows. A mould 2, 3 is provided with centering elements 4 which can be either full-length hollow pipes or possibly only pipe stubs or shaft pins at the ends of the pillar to be cast. The centering element 4 is next surrounded by reinforcing steels 5 comprising bars aligned parallel with the concrete pillar's axis

and steel wire wound about the bars. Concrete mix 6 is cast in the mould 2, 3 and allowed to harden and dry. In the embodiment described in Fig. 3, the concrete element is divided by cutting the concrete pillars separate from each other with a saw. The sawn gaps are indicated by reference number 7. The concrete pillar element is next centered in a concrete saw cutting unit 8. Then, the concrete pillar element is cut by sawing to attain a desiredly shaped cross section for the pillar. A selection of different shapes are illustrated in Figs. 7...11. The concrete pillar shown in Fig. 11 is provided with grooves 9 into which wall panel elements can be inserted. If the concrete mix is complemented with stone aggregates of 30...100 mm diameter, an attractive decoration of the pillar surface is obtained.

Claims

1. A production method for a concrete pillar (1) in which method concrete mix (6) is cast into a mould (2, 3), after which the hardened concrete is cut, said production method being **characterized** by the following combination of work phases:
centering elements (4), such as a full-length hollow pipe, are mounted in said mould (2, 3);
reinforcing steels (5) are optionally placed about the centering element;
concrete mix (6) is introduced into the mould (2, 3), the mix (6) is allowed to harden and dry,
the concrete pillar element is stripped free from the mould,
the concrete pillar element is centered in a saw-type cutting unit (8) for the concrete pillar element, and
the sides of the concrete pillar element are cut by sawing so as to attain a desired cross section for the pillar.
2. A production method as defined in claim 1, **characterized** in that said concrete pillar is cut by sawing to attain a cross section shaped as a square (Fig. 7), hexagon, octagon, etc.
3. A production method as defined in claim 1 or 2, **characterized** in that said concrete pillar is cut by sawing to a conical shape.
4. A production method as defined in claim 2 or 3, **characterized** in that a plurality of adjacently placed centering elements (4) are enclosed by casting in a common mould (3) so that several pillars can be obtained from a single mould (3) by separating the pillars (7) from the cast concrete element by cutting with a saw.

5. A production method as defined in any of the foregoing claims, **characterized** in that the concrete pillar (Fig. 11) is cut with a saw to incorporate grooves (9) for the mounting of wall elements.
6. A production method as defined in any of the foregoing claims, **characterized** in that the concrete mix is filled with stone aggregates of 30...100 mm diameter, whereby the stones are cut during the sawing phase thus producing a decorative surface.
7. A production method as defined in any of the foregoing claims, **characterized** in that the surface of the concrete pillar is ground to a high polish after cutting with a saw.

Patentansprüche

1. Herstellungsverfahren für Betonpfeiler (1), wobei Betongemisch (6) in eine Form (2,3) eingegossen wird, worauf der ausgehärtete Beton geschnitten wird, gekennzeichnet durch die folgenden Arbeitsschritte:
Zentrierelemente (4) wie Rohre voller Länge werden in der Form (2,3) angeordnet;
Armierungsstähle (5) werden willkürlich um das Zentrierelement herum angeordnet;
Betongemisch (6) wird in die Form (2,3) eingeführt, das Gemisch (6) wird aushärten und trocknen gelassen, das Betonpfeilerelement wird von der Form abgestreift, das Betonpfeilerelement wird in einer Sägeschneideinheit (8) für das Betonpfeilerelement zentriert, und die Seiten des Betonpfeilerelementes werden durch Sägen beschnitten, um den gewünschten Querschnitt des Pfeilers zu erhalten.
2. Herstellungsverfahren nach Anspruch 1, dadurch gekennzeichnet, daß der Betonpfeiler durch Sägen beschnitten wird, um einen Querschnitt wie z.B. ein Quadrat (Fig. 7), ein Sechseck, ein Achteck, usw. zu erhalten.
3. Herstellungsverfahren nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß der Betonpfeiler durch Sägen in eine konische Gestalt zugeschnitten wird.
4. Herstellungsverfahren nach Anspruch 2 oder 3, dadurch gekennzeichnet, daß eine Mehrzahl von einander benachbarter Zentrierelemente (4) durch Gießen in einer gemeinsamen Form (3) eingeschlossen wird, so daß mehrere Pfeiler in einer einzigen Form (3) dadurch erhalten werden können, daß die Pfeiler (7) vom gegossenen Betonelement durch Zerschneiden mit einer Säge

getrennt werden.

5. Herstellungsverfahren nach einem der vorausgegangenen Ansprüche, dadurch gekennzeichnet, daß der Betonpfeiler (Fig. 11) mit einer Säge geschnitten wird, um Nuten (9) zum Montieren von Wandelementen aufzuweisen. 5
6. Herstellungsverfahren nach einem der vorausgegangenen Ansprüche, dadurch gekennzeichnet, daß das Betongemisch mit Steinaggregaten von 30 - 100 mm Durchmesser angefüllt wird, wobei die Steine während des Sägens geschnitten werden, so daß eine dekorative Oberfläche geschaffen wird. 10 15
7. Herstellungsverfahren nach einem der vorausgegangenen Ansprüche, dadurch gekennzeichnet, daß die Fläche des Betonpfeilers nach dem Schneiden mit einer Säge durch Schleifen auf Hochglanz poliert wird. 20

Revendications

1. Méthode de fabrication de colonne en béton (1) selon laquelle le mélange de béton (2) est coulé dans un moule (2, 3), après quoi le béton durci est découpé, ladite méthode de fabrication étant caractérisée par la combinaison des étapes de travail suivantes :
des éléments de centrage (4), tels que des tuyaux creux de longueur normale, sont mis en place dans le moule (2, 3) ;
des tiges d'acier à béton armé (5) sont facultativement positionnés autour de l'élément de centrage ;
le mélange de béton (6) est introduit dans le moule (2, 3), puis après séchage et durcissement du mélange (6), l'élément de colonne en béton est démoulé puis centré dans une unité de découpe de type scie (8) pour élément de colonne en béton, et les côtés de l'élément de colonne en béton sont découpés par sciage pour obtenir une section requise pour la colonne. 30 35 40 45
2. Méthode de fabrication selon la revendication 1, caractérisée en ce que la colonne en béton est découpée par sciage pour obtenir une section en forme de carré (figure 7), hexagone, octogone, etc. 50
3. Méthode de fabrication selon les revendications 1 ou 2, caractérisée en ce que la colonne en béton est découpée par sciage en une forme conique. 55
4. Méthode de fabrication selon les revendications

2 ou 3, caractérisée en ce qu'une pluralité d'éléments de centrage (4) positionnés de façon contiguë sont enfermés par couée dans un moule commun (3), de sorte que plusieurs colonnes peuvent être obtenues à partir d'un seul moule (3) par séparation des colonnes (7) de l'élément en béton moulé en les découpant à l'aide d'une scie.

5. Méthode de fabrication selon l'une quelconque des revendications précédentes, caractérisée en ce que la colonne en béton (figure 11) est découpée à la scie pour incorporer des rainures (9) destinées au montage d'éléments de mur.
6. Méthode de fabrication selon l'une quelconque des revendications précédentes, caractérisée en ce que le mélange de béton est rempli d'agréats de pierre de 30 à 100 mm de diamètre, la découpe des agrégats pendant l'étape de sciage produisant ainsi une surface décorative.
7. Méthode de fabrication selon l'une quelconque des revendications précédentes, caractérisée en ce que la surface de la colonne en béton est meulée jusqu'à l'obtention d'un polissage de précision après la découpe à la scie.

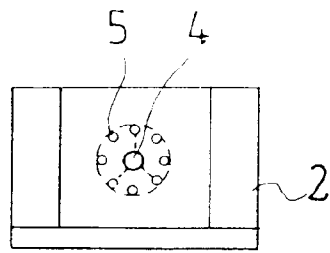


Fig. 1

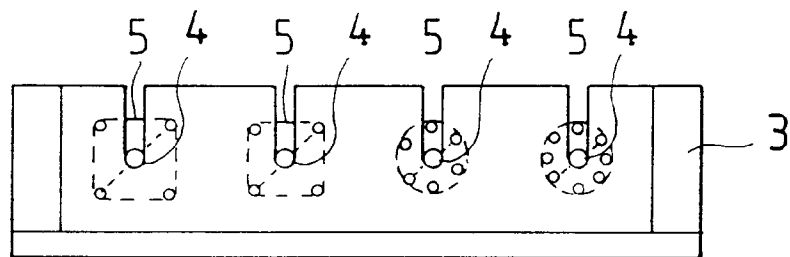


Fig. 2

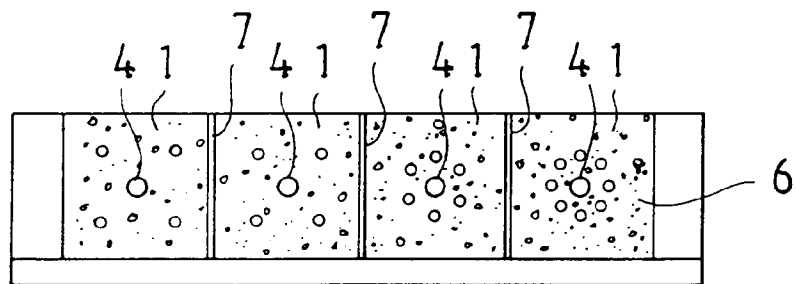


Fig. 3

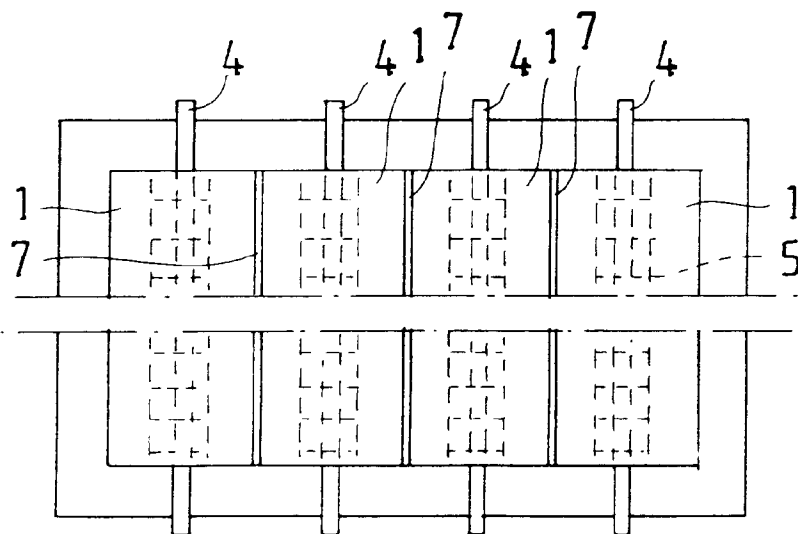


Fig. 4

