Nov. 15, 1955 A. PAQUIN-KLEINERMANN 2,723,607

PAVEMENT

Filed April 3, 1951

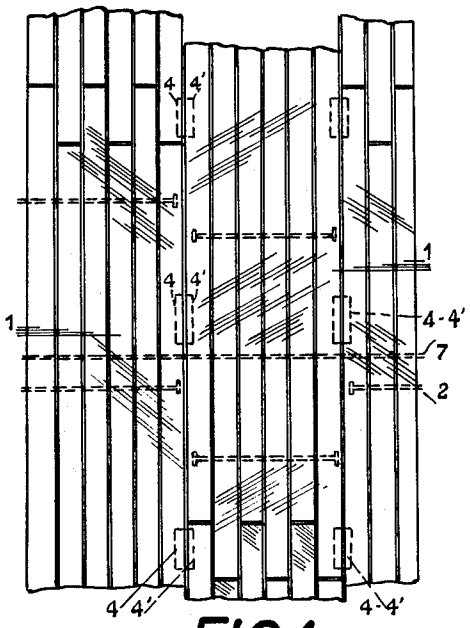

FIG.1

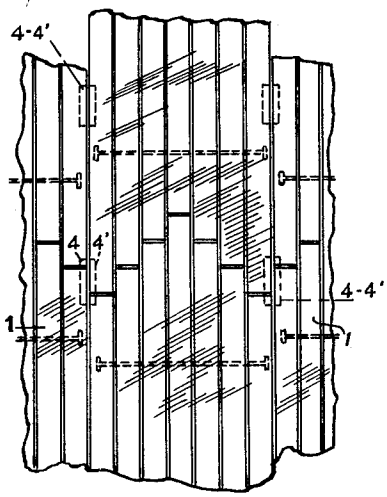

FIG.2

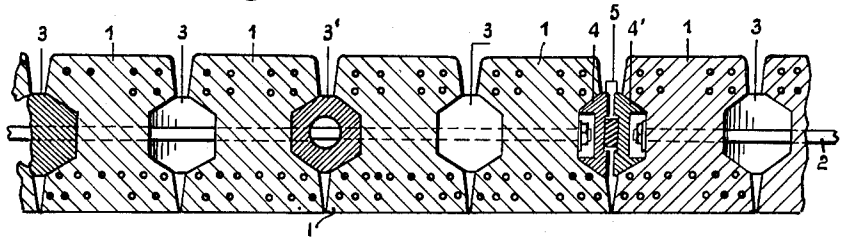

FIG.3

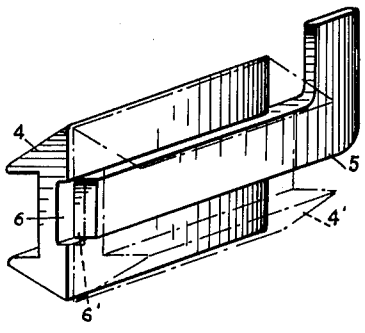

FIG.4

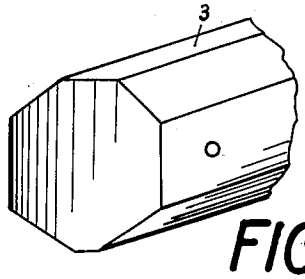

FIG.5

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United States Patent Office 2,723,607 Patented Nov. 15, 1955

2,723,607

PAVEMENT

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Application April 3, 1951, Serial No. 218,946

Claims priority, application Belgium April 21, 1950

1 Claim. (Cl. 94—.13)

The present invention has for its object a pavement in the form of a covering made of prefabricated material for hardening the ground, that is particularly suitable for surfaces and areas of airports and the like.

Said covering is chiefly characterized by the fact that it includes a plurality of slabs arranged side by side after the manner of a mosaic, preferably along the axis of the landing area, fitted laterally through anchoring and longitudinally through assembling by means of multiple end joints so as to provide a yielding covering adapted to absorb the impact of heavy masses.

Generally speaking, for large surfaces that have to carry very heavy loads, concrete, possibly reinforced, was used hitherto through casting in situ; the areas were executed section by section and the sections were separated by expansion joints. As concerns more particularly landing areas for aircrafts, they should be capable of supporting very heavy loads and of offering a sufficient resistance to the impact produced by the loads that engage the area suddenly and often roughly.

As modern aircrafts become more and more heavy, the landing areas become thereby more and more difficult to establish in accordance with these increasing requirements. The only remedy found hitherto consisted in an increase in the thickness of the covering in order to prevent the breaking under abnormal operating conditions.

Practice shows furthermore that deformation of the bed and damage to the above mentioned joints lead to the infiltration of water and consequently to the production of drifts under the cast concrete, whereby the slabs are often overhung and cannot resist the originally foreseen stresses.

The present invention has for its object to remove these multiple drawbacks. It will be better understood from the following description, reference being made to accompanying drawings illustrating by way of example two embodiments of the present invention.

Fig. 1 is a plan view partly sectional of a landing area established in conformity with the present invention, the shape of the elements being such that the connection between the slabs is similar to a tongue and groove joint.

Fig. 2 shows a modification of the slabs, whereby the assembly shows a joining line assuming a stepped shape.

Fig. 3 illustrates on a larger scale a partial longitudinal section through a landing area.

Fig. 4 is a perspective view on a larger scale of a coupling guide member with its key.

Fig. 5 is a perspective view on a larger scale of an insert to be positioned between the slab beams.

In the embodiment illustrated in Figs. 1, 3, 4 and 5, the covering is constituted by reinforced beams **1** preferably of precompressed concrete assuming a single or double flanged and possibly any other suitable cross sections, according to the case; said beams the cross section of which has been thus suitably selected are laid in the simplest case and for comparatively moderate loads directly on the ground, side by side, preferably along the axis of the landing area.

The sizes of the beams **1** are conventional; by way of exemplification, they may assume a length of 6 m., a breadth of 0.166 m. and a thickness of 0.20 m.

A plurality of beams (six, in the example illustrated in the drawings) are interconnected to form a unit and are held together by cross bars **2**, while inserts **3** of a suitable cross section are positioned either throughout the length or at various locations provided between said beams **1**, i. e. in recesses formed between the latter.

The assembly of the beams should be performed with the ends projecting in a manner such that when the laying is performed, the outstanding ends of one group of say six beams, i. e. of one structural unit, may fit in the free spaces left between the beams in the immediately preceding unit so as to form an assembly having a joint with multiple ends.

Referring to Fig. 2, the beams are assembled to form a slab in a manner such that the line of connection between the different units of a landing area appears under the form of steps. Obviously, it is possible to imagine however a great variety of such projecting ends that may assume the most different forms so that the slabs or structural units show the desired shape at their connecting lines without unduly widening the scope of the invention.

In the execution of a landing area, the various slabs or units forming the components of its structure are prefabricated and brought to the airport, so as to be laid in situ in the desired position over the breadth and length of the area to be established.

Between the units are arranged at regular intervals two coupling members in the form of blocks **4—4'** that are housed inside the longitudinal keyways formed in the confronting, upwardly diverging, sloping side faces of two juxtaposed units; as soon as the units are laid over the ground, a spreader member in the form of a key **5** is driven into the grooves **6—6'** formed in the side faces of the blocks which are directed toward one another whereby, in spite of their connection, each slab may transmit at least partly the stress received to the adjacent slab or slabs.

As described hereinabove, the beams are assembled through ties **2** provided with inserts **3** whereas the various slabs that are suitably connected transversely transmit the stresses received to the adjacent slabs through the agency of the guide members **4—4'**; the consequence is that the system thus executed allows cutting out any creeping of all or part of the structure.

To give the system a still greater cohesion, cables, rods **7** or the like may be stretched across the various slabs throughout or possibly across part of the breadth of the landing area.

The landing area executed according to the invention satisfies the desired conditions, i. e. the prefabricated slabs allow all tests as to resistance before laying in situ. Said slabs that have a considerable elasticity of their own, form a pivotally linked carrying surface capable of absorbing without breaking the contacting impact of the masses that may engage it suddenly.

Furthermore the covering thus established is totally permeable by reason of the fact that the groups of beams and the slabs are not in joining relationship with one another.

Lastly, it is always possible to replace one damaged group by another and this is done with a great ease in a minimum time through the operation of the keys **5**; the laying of the work and when required its repair is totally independent of atmospheric conditions.

The inserts **3** have been provided hereinabove for constraining the beams of one unit to work simultaneously, in

other words for allowing a distribution of the load received by one of them, but obviously such inserts may appear under the form of prefabricated small arches, the assembly being performed again through the agency of ties so as to constitute the elements that are laid over the ground to be covered so as to form a landing area.

Similarly, the invention allows obviously without widening its scope the laying of slabs no longer directly on the ground but on a bed, constituted by recessed slabs for instance that are made of reinforced concrete, so as to increase the loading capacity of the landing area while obtaining the advantageous elasticity and pivotal mounting of the work as a whole or to allow the establishment of the landing area over a ground the character of which is but little favorable.

The running surface of the beams may be indented in order to serve as an ice breaker in case glazed frost appears, or else for improving the adherence of elastic wheel tires.

As the whole of the covering shows hollow channels, it is possible also to incorporate to it heating means adapted to prevent the formation of glazed frost. In this case, the insert 3' is also hollow. (See Fig. 3.)

Preferably, the inserts and the guide members appear at regular intervals so as to provide for the presence of open spaces that allow the collection of rain water and the exhaust thereof if required into sumps.

The formation of slabs through beams connected by means of ties and held at the desired spacing by inserts provides a great yieldingness for such slabs, but obviously they may by executed by means of a single casting of prestressed concrete for instance.

The invention has been described by way of a mere exemplification and by no means in a binding sense and obviously many modifications may be brought to its details without widening its scope.

What I claim is:

A pavement comprising, in combination, a plurality of pavement units located in end to end and side by side relation, each unit end which is adjacent another unit end

having projecting portions defining free spaces receiving and substantially filled by projecting portions of the next unit end and extending into and substantially filling free spaces defined by the projecting portions of the next unit end, and each unit having a sloping side face directed toward the next laterally adjacent unit, diverging therefrom in an upward direction, and formed with a longitudinally extending keyway, said keyways being located at substantially the same elevation so that each pair of laterally adjacent units is provided with aligned keyways confronting each other, said sloping side faces giving access to said keyways; a pair of coupling members respectively located in said keyways of each pair of laterally adjacent units and respectively having side surfaces spaced from and directed toward each other, said latter side surfaces respectively being formed with longitudinal aligned grooves; and a key located in said grooves and engaging said side surfaces of each pair of coupling members to urge the latter apart from each other and to cooperate with said coupling members for interconnecting each pair of laterally adjacent units.

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