

"PROCESS FOR KEEPING DRY THE SPACE BETWEEN AN OUTSIDE WALL
OF A BUILDING AND A FACADE STRUCTURE"

5 The invention relates to a process for keeping
dry the space between an outside wall of a building and a
facade structure, and means for carrying out the process.

Particularly in the case of air-conditioned
buildings the pressure inside the building is higher than
that of the external atmosphere around it. In the case of
10 large buildings in particular, facade structures cannot be
completely sealed so that air flows out from the higher
pressure area in the interior to the atmosphere. This
results in a drop in temperature which can frequently be so
large that the relative air humidity can assume a value of
15 100% or more, thus causing the water vapour to condense.
If the outside temperature is below freezing point,
condensate running off the facade structure is frozen into
icicles forming either at the bottom part since the
condensate tends to flow downwards or at the top part of
20 the facade structure since behind the latter the air
current tends to flow upwards.

The object of the invention is to achieve a
process and equipment by which such icicle formation on the
facade structure is prevented.

25 According to the invention air at a pressure
higher than the atmospheric air pressure is directed behind

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the facade structure so that between the outside wall and the facade structure a pressure is built up and maintained which is greater than the maximum water column formed at the facade structure in a joint area.

5 The points at which there are difficulties in sealing off the facade structure are particularly the joints between panels since gaps have to be left there to allow for thermal expansion. Air pumped in behind the facade structure can then escape through these gaps to the outside
10 of the building. The pressure of the air in the space between the outside wall and the facade structure must be sufficiently high that even on a sloping roof structure the rain water collecting in the sealing joints thereof cannot penetrate through leaks in the sealing profile behind the
15 facade structure, but is blown out by the air inside. The air pressure to be generated is therefore determined by the water column which can form between the sealing profile and the top of the panel.

20 The air used to pressurize said space is preferably drawn in from the surrounding atmosphere and directed behind the facade structure. Thus the facade structure is pressurized using air from outside which has a lower absolute humidity as long as the outside air is at lower temperature than the air inside the building. If
25 there are leaks in the outside walls of the building the penetration of air presents no problems since in general the air temperature is higher inside the building and the entry of colder outside air reduces the relative humidity.

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The process covered by the invention is for use particularly in existing buildings but it can also be incorporated in new buildings on erection. Use of the process makes it possible for the tolerances at the sealing profiles during erection of the facade to be less strict, since any leaks remaining are in practice sealed off by pressurizing a facade from within. It should merely be noted that the tolerances should be kept within limits in which the build up of the pressure behind the facade structure is still an economic proposition, i.e. so that the air flow through the structure is kept as low as possible and thus only a slight differential pressure must be maintained.

The use of the present process with buildings having a facade structure is both from the point of view of technical complication and also from that of maintenance costs negligible compared to the expenditure on the air-conditioning system and other electrical equipment which is necessary for such a building.

To carry out the process, means in accordance with the invention can employ horizontal and vertical conduits mounted behind the facade structure, and fans mounted at the conduit inlets drawing in air from outside. In this respect the fans can be mounted at either the bottom or the top end of a vertical conduit. In a preferred construction the columns and the cross members of the structure form the conduits.

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The invention is explained in more detail below by means of several examples referring to the accompanying drawings. In the drawings:

5 Fig. 1 is a section through an inclined facade structure,

Fig. 2 is a section through a join between two panels of an inclined facade structure,

Fig. 3 is a section through a fixing point for facade panels, and

10 Fig. 4 is a section through the top part of a building.

The facade structure shown in Fig. 1 comprises inclined columns 10, horizontal cross members 12 and panels 14 between them. Between the panels forming the outside wall of the facade and the inside wall of the building, which is not shown, vertical conduits 16 are mounted and connected together by transverse conduits 18. At the bottom end of the vertical conduits 16 a fan 20 is mounted, drawing in outside air as shown by arrow 22 and pumping it behind the panels 14 via the conduits 16 and 18. Thus a pressure is generated higher than that of the ambient atmosphere so that any rain or condensate water collecting in the outer part of the facade structure is blown out by the air flowing out from the inside of the structure.

25 Since the water can no longer collect this prevents the formation of icicles which would otherwise occur at low temperatures.

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Fig. 2 shows an enlarged illustration of the join between two panels 24 and 26 fixed to a cross member 28. Sealing profiles 30 are fitted between the edges of the panels 24 and 26 and a further sealing profile 32 is provided on the outside of the panels, screwed into place and also securing the panels in position. Rain water and condensate can collect in particular in the areas 34 and 36 at the sealing profile 32. The pressure of the air blown in behind the facade structure, typically via a horizontal conduit 38, must therefore be sufficiently great to blow out the water collecting in the areas 34 and 36.

Fig. 3 shows a section through a vertical facade with panels 40 and 42 fixed to a cross member 44. The cross member 44 has a drilling through it in which a bush 46 is fitted. The air blown from a horizontal conduit 51 into the vertical conduit 50 flows through the bush 46 to between the edges of the panels 40 and 42 behind the sealing strip 48 which also serves to fix the panels 40 and 42 into the cross member 44. If any leaks occur between the panels and the sealing strip 48 or the sealing strips 49 provided on the cross member 44, the air pumped behind the facade structure can pass through at these points and prevent water collecting.

As can be seen from Fig. 1 a fan pressurizing the facade structure can be mounted at the bottom of the structure. It is however also possible to mount a fan at the top drawing in the air from outside and delivering it

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downwards behind the structure. Such an installation is shown in Fig. 4. In front of an outside wall 60 of a building a facade structure with panels 62 is mounted. The panels 62 are sealed at the top via a cross member 64 or
5 profile metal section enclosed with insulating material 66 to a supporting plate 68. A fan 70 is mounted on the supporting plate 68 and operates to force external air between the outside wall 60 of the building and the panels 62.



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CLAIMS:

1. A process for keeping dry the space between an outside wall of a building and a facade structure, wherein air at a pressure higher than the atmospheric air pressure is directed behind the facade structure so that between the outside wall and the facade structure a pressure is built up and maintained which is greater than the maximum water column formed at the facade structure in a joint area.
2. A process according to claim 1, wherein the air which is directed behind the facade structure is taken from the ambient atmosphere.
3. Means for carrying out the process according to claim 2, wherein behind the facade structure horizontal and vertical conduits are mounted and fans are mounted at the conduit inlets drawing in air from outside.
4. Means according to claim 3, wherein said fans are mounted at the bottom ends of vertical conduits.
5. Means according to claim 3, wherein said fans are mounted at the top ends of vertical conduits.
6. Means according to any one of claims 3 to 5, wherein the columns and cross members of the facade structure form



the conduits.

7. A process for keeping dry the space between an outside wall of a building and a facade structure, substantially as herein particularly described with
5 reference to any one of the accompanying drawings.

8. Means for keeping dry the space between an outside wall of a building and a facade structure, substantially as herein particularly described with reference to any one of the accompanying drawings.

10 9. An installation comprising a facade structure and means for keeping dry the space between an outside wall of a building and that structure, substantially as herein particularly described with reference to any one of the accompanying drawings.
