

Old watermills in Bosnia and Herzegovina

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1 Abstract

English

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Mills played a big role in the territory of Bosnia and Herzegovina with their efficiency and easy way of functioning and working, but in spite of this, a lot of attention had to be given to the construction itself and to the production of the mill as a building. This paper will explain in detail the structure of mills and the way they function, i.e. their detailed mode of work, as well as the types of materials necessary for their production, respectively the specific types of wood, and the whole construction of a mill, their interior, and a few more of their more important characteristics which makes them what they are

Bosnian

Ključne riječi: mlinovi, konstrukcija mlina, interijer, efikasnost mlina

Mlinovi su imali veliku ulogu na području Bosne i Hercegovine samom svojom efikasnošću i jednostavnim načinom rada ali unatoč tome, moralo se jako paziti na samu konstrukciju i na izradu mlina kao objekta, pa će se u ovom radu detaljnije objasniti struktura i način na koji mlinovi funkcioniraju, tj. njihov detaljan način rada, također vrste materijala potrebni za njihovu izradu, odnosno potrebne vrste drveta kao i cijela konstrukcija mlina, njihov interijer i još neke njihove važnije karakteristike koje ih čine to što jesu.

1. Introduction

Mills are perfect example of coexistence between man and water, not just in the land of Bosnia and Herzegovina, but all over the world. Wherever there was life, bread and water are the basic of living. Only written records are found in 18-th century where colonies of water mills already existed that together made unique production potential. Milling was not an easy job, so the ownership of the mills changed through the history.

Taking care of mills was the job of many people, not just the millers. The wheel needed to be coordinated with the millstone, make the mill easy accessible to the farmer, and the miller, so roads and bridges are built that lead to the mill itself. In the winter mills were not used, so the people who were in charge, met there and fixed what was damaged. Every year the repairs were inevitable.



Figure 1. Old watermill near Cazin.

2. The function of mills

By pulling the handle that is called the „ustava“ , outdoor wicket is open above the gutter that directs the water on the wheel paddles that are underneath the mill. In the wheel are situated spindle, large gear wheel , spur wheel and a large vertically mounted shaft that transfers the power to the upper millstone called the „Crown wheel“, while the lower millstone called the „Pit wheel“ stays passive.

Grains are poured in a wooden basket that is reverse pyramid shaped which stands above the millstone. In the lower part of the basket is an opening that pours the grains evenly in the middle of the millstone and through this way grains get between two millstones where the process of grinding into flour of appropriate size.

After the grains are grinded, flour is poured and collected in a wooden basket situated at the front the mill. There is another device that also makes sure the grains are poured evenly and it moves along the millstone as another precaution. Finally, using a wooden scoop, the flour is transferred in a knitted bag.

Mill is protected with a wooden house which is like a pile dwelling built on wooden pillars above the water.

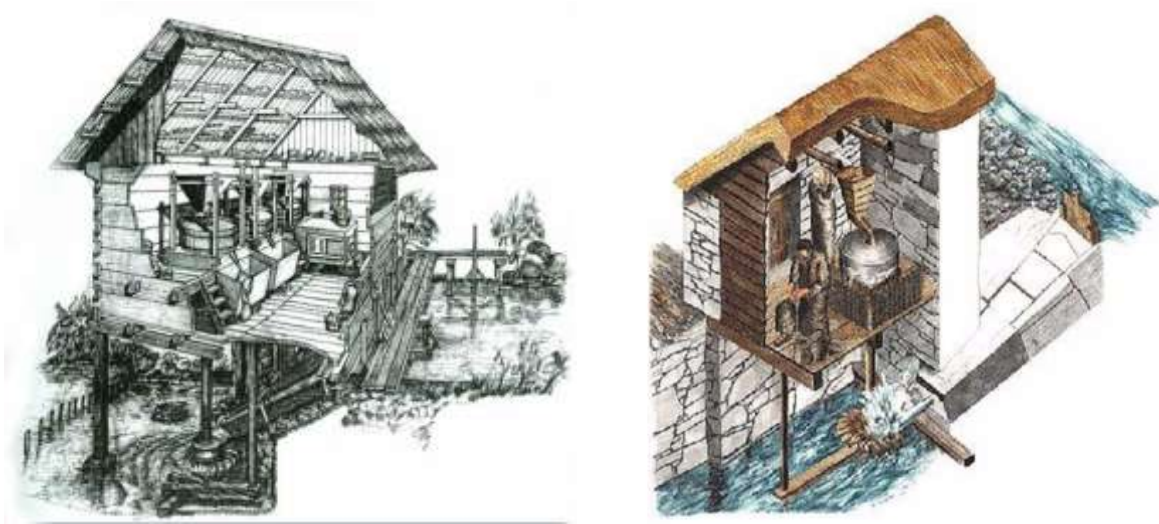


Figure 2. Representation of the function of the mills

3. Materialization and construction

The basic construction of water mills is made up of massive oak pylons with a diameter of 15 - 20cm, with wooden planks nailed in with nails diagonally across the pylons, thus forming a binned construction of the primary constructional system. The top zone of pylons is connected by steel planks for horizontal beams which make up the primary carriers of the top part. Beams are placed next to each other on the horizontal beams which make up the construction of the floor. On the lowest point of the floor more beams are put into place by a carpenter bond as a brace for the vertical carriers of the construction of the roof. Vertical carriers lean against an additional beam with stiffened steel planks for the primary beam construction. In between the vertical carriers are boarded filling, tied together with a carpenter bond. The construction of the roof is made up of four primary beams connected into a ridge, or so called hipped roof. Opposing batten are nailed in at 30 - 40cm intervals, depending on the size of the shingle as the roof lining. Not long after the first collapse, the shingle was replace with galvanized sheet metal as the final layer of the roof. The bottom rotational part of the mill, "the wheel", is made up of more parts. The primary carrying part of the wheel is a spindle made from the wood of a wild pear, which was used raw. The secondary part is the body of the carrier for the spoons which is made from cherry trees or alder trees, as are the spoons.



Figure 3. Representation of the mill construction

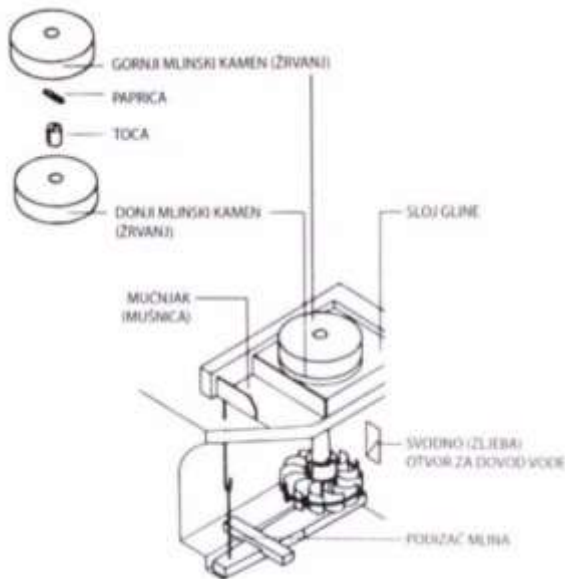


Figure 4. Mills details

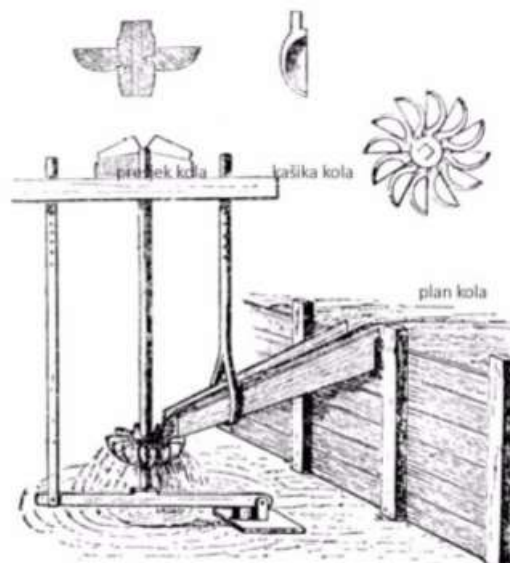


Figure 5. Illustration of the stream watermill

4. Interior

When we look at the interior of the mills, there was not a lot of attention to it, because the primary role of the mill was its functionality i.e. need for the flour. On the entrance into the mill we can see oak doors, boards were handmade and shaped 2-3 cm set vertically next to each other and connected by two horizontally boards on the bottom and on the top of the doors. Since mills were small, an optimal disposition had to be made. Millstones and the crate were in the corner, benches were against the wall. Heating stove was usually across the crate and some mills had a place similar to keeping room aka. pantry..



Figure 6. Basket and millstone



Figure 7. Oven

5. Conclusion

Relation between people and their environment, which made these natural and architectural parts, testifies about a special way of exploiting the natural resources that is primarily sustainable. The way buildings were seated in the area testifies the tendency of local builders to fit them the easiest way into the natural environment, without imposing the ambient or aspiration for the environment to subordinate to them. The way of using the water flow does not damage natural environment or resources, yet respects specific characteristics and limitations of their surroundings.

Their position is conditioned mainly by the power of water flow ; built where the stream isn't too strong, but provides constant energy source for propulsion of millstones. That was the main reason that determined their position. Most mills belong to the same type of constructions without bigger differences in the construction itself. Usually mills had one floor and almost always were covered with a pyramid hip roof.

6. Literature

- [1] <https://hr.wikipedia.org/wiki/Mlin>
- [2] <http://haler.blogger.ba/arhiva/2012/05/10/3303936>