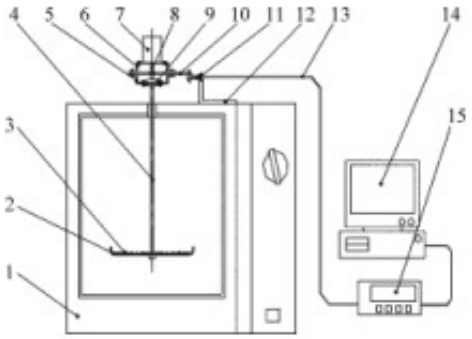
Summary of patented technology for wood drying technology

Abstract: This paper analyzes the development of various technologies of wood drying in recent years through the collection, indexing and combing of patent documents in the field of wood drying technology, and studies the evolution route of main wood microwave drying equipment, which can help to improve this. The review efficiency of the field examiner brings the examiner closer to the skilled person in the field.

Key words: wood microwave drying; energy saving

Drying is an indispensable and important process in the processing of various forms of wood. It is the most energy-intensive process in the production of wood products. Common artificial wood drying methods that have been industrialized to date include conventional drying, dehumidifying drying (also known as heat pump drying), solar drying, vacuum drying, high frequency drying, microwave drying, infrared drying, and other drying methods (mainly



combined drying).

Conventional drying dominates the field of wood drying, while conventional steam drying is dominant in it, and conventional drying with furnace gas, hot water, and hot oil as heat sources is less used. China's technical level and technical performance of conventional drying equipment are close to the advanced level of foreign countries, and some aspects have their own characteristics.

In addition to the conventional drying methods, vacuum, dehumidification, high frequency, microwave, infrared, and solar energy were successfully applied to wood drying in the 1970s and 1980s, and all of them have good development prospects within their respective scopes of application. Other drying methods mainly combine dry drying to occupy 21% of the world's patent applications, because each drying method has its own advantages and scope of application, combined drying can achieve the purpose of strengths and weaknesses, so it is the focus of future wood drying development.

From the time point of view, the wood drying technology before 1987 is still in the initial stage of germination, and the application volume is still relatively small. Since 1987, the wood drying

technology has gradually gained the attention of researchers, and the number of applications has increased year by year, among which the trend of Chinese patent applications has changed. Especially remarkable.

From a regional perspective, China has studied under various technical themes such as conventional drying, dehumidifying and drying, vacuum drying, microwave drying, solar drying, and joint drying, and Beijing Wood Drying Technology has the largest number of patent applications, and its applicants are mainly For the patent application of wood drying in Beijing Forestry University, the total number of patent applications for wood drying technology in northern China is higher than that in the southern region.

From the technical point of view, conventional drying has a dominant position in the current long period of time due to its mature technology and strong adaptability. Dehumidifying and drying, vacuum drying and solar drying all use clean energy as a heat source and have their own characteristics. Different degrees of continuous development will be achieved within different scopes of application. Various joint drying technologies will be the focus of future wood drying development and an important direction for researchers.