The late E.F.Woods was the inventor of the Apidictor.

"Sound engineers are familiar with a phenomenon known as the 'cocktail party effect'. This is the ability of the human brain, in a room full of chattering people, to pick out and concentrate on one conversation, not necessarily the loudest. Eddie was blessed with this ability and it served him well when listening to the medley of sounds that his microphone picked up in the hive.

One sound that caught his attention was a sort of warbling noise that varied between the notes A and C sharp; that's 225 - 285 Hz in terms of frequency. He noticed that this sound got steadily louder, then it stopped and a day or so later a swarm took off.

Eventually, he decided that it was made by the 4-1/2 to 6 day old nurse bees, his reasoning being as follows:

In a normal colony there are about 4,000 nurse bees, half of which feed the brood and the other half, the queen, who eats 20 times her own weight in a day.

When a colony decides to swarm, its first action is to reduce the supply of food to the queen in order to slim her down into a condition for flying. This puts some of the nurse bees out of work and reduces her egg laying. Hence, a few days later, there are fewer larvae to feed so more nurse bees become unemployed and the whole process is progressive.

The nurses have to get rid of the energy that would go into food production so they probably stand there exercising by flapping their wings, fanning in fact, but how do we account for the peculiar frequency?

In flight, an adult bee flaps its wings 250 times a second but when fanning, it grips the comb and this brings the frequency down to 190 Hz. (Hz is just an abbreviation for Hertz which is the engineer's word for 'times a second'.) However, a young bee's wings do not harden completely until it is 9 days old and until then the resonant frequency is higher. It may be that 4-1/2 day wings resonate at 285Hz and the 6 day old ones at 225Hz and the sound is a mixture of single frequencies rather than a collection of warbles from individual bees.

Eddie built a simple audio frequency amplifier with microphone and headphones and incorporated what is known as a bandpass filter. This allowed the frequency band 225-285Hz through to the ear and blocked off the rest, making it easier to hear.

Note that the flight frequency of 250 Hz falls in this band which is why the tests should be made in the evening after flying has stopped.

Eddie stressed that the warble does not necessarily indicate a swarm; it indicates that the queen has gone off laying and there could be other reasons. In any case, it means a brood nest inspection is needed.

If you give a hive a knock with the flat of the hand, the bees hiss at you and this is something that Eddie listened to very carefully. Under normal conditions it is a short sharp noise, lasting about 1/2 a second, starting and finishing quite suddenly; the bees are alert and defensive. If a swarm is in the offing, the bees are in a happy-go-lucky mood, the sound is not so loud, rising and falling less sharply. Eddie described this as a loyalty sound and he fitted another filter to help pick it out.

With this instrument he found he could get up to three weeks warning of swarm preparations and was alerted 10 days before queen cells were started.

He fitted the instrument with a 3-position switch for listening to the normal hive noise, the warble and the hiss. With added refinements he called it the Apdictor, patented it and marketed it in 1964, selling about 300 worldwide.

The reason it never caught on, I suspect, is because most beekeepers were non-technical and very conservative. How often have you heard them say, "It was good enough for my father and it is good enough for me"? Nevertheless, those beekeepers who mastered it swore by it and some are still in use today, 36 years later. Last year I was instrumental in getting faults cured for two users who were anxious to get faulty ones working again.

Today we live in a more technical world with advances in miniaturisation, chips and so on and I think such an instrument would be more acceptable.

Indeed, my vision is of a detector in every hive with a little transmitter that sends a signal back to base whenever the warble exceeds the critical level.

Having 'inherited' many of Eddie's papers, I have been able to study his work over the years, have written a small book about it and can supply technical data if anybody happens to have an Apidictor that needs repair."